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# CONTENTS

THE WHOLE OF THE LITERARY MATTER IN THE LANCET IS COPYRIGHT.

**THE OLIVER-SHARPEY LECTURES** on Carbohydrate Metabolism in Health and Disease. By Prof. HUGH MACLEAN, M.D., D.Sc.—Lecture I. (*Illustrated*) ..... 1129

**PRESIDENTIAL ADDRESS** on the Present Position of Chloroform. By ARTHUR MILLS, M.D. 1134

**ORIGINAL ARTICLES.**

The Pathological Action of Light Upon the Eye. By W. STEWART DUKE-ELDER, B.Sc., M.D., F.R.C.S. I.—Action on the Outer Eye: Photophthalmia ..... 1137

The After-Effects of Diphtheria on the Heart. By JENNER HOSKIN, M.D.—(*Illustrated*) ..... 1141

The Nature of the Depressor Substance or Substances in Tissue Extracts. By SWALE VINCENT, M.D., D.Sc., and F. R. CURTIS, M.Sc., M.B. ..... 1142

**MEDICAL SOCIETIES.**

Royal Society of Medicine: Section of Laryngology ..... 1143

Edinburgh Obstetrical Society ..... 1144

Royal Academy of Medicine in Ireland: Sections of Medicine and Anatomy and Physiology ..... 1145

**THE GENERAL MEDICAL COUNCIL.**

Penal Cases.—Reports of Committees and Other Business ..... 1146

**REVIEWS AND NOTICES OF BOOKS.**

Chronic Infection of the Jaws. By Stanley Colyer, M.D. ..... 1151

Diseases of Children. By H. C. Cameron, M.D. .. 1151

Kinderheilkunde. By Dr. R. Lederer ..... 1151

Public Health Laboratory Work (Chemistry). By Prof. Henry R. Kenwood, M.B. ..... 1152

Dictionary of Applied Chemistry. By Sir Edward Thorpe, F.R.S. 1152

Biological Memory. By Prof. Eugenio Rignano. Translated by E. W. MacBride, D.Sc., F.R.S. 1152

**LEADING ARTICLES.**

X RAY TREATMENT OF CANCER ..... 1153

THE DENTAL BOARD'S BUDGET ..... 1154

SPA TREATMENT ..... 1154

THE LISTER INSTITUTE OF PREVENTIVE MEDICINE 1155

**ANNOTATIONS.**

Sir Frederick Mott ..... 1156

The Importation of Foot-and-Mouth Disease ... 1156

The Botelho Reaction for Cancer ..... 1157

A Medical Visit to Biarritz 1157

Oleothorax ..... 1157

Trauma and Malignant Growths ..... 1158

Status Lymphaticus .... 1158

Complimentary Dinner to Sir StClair Thomson... 1158

Objects Resembling Spirochætes ..... 1159

Bird Droppings ..... 1159

**MODERN TECHNIQUE IN TREATMENT.**

CLXXVI.—The Treatment of Anæmia. I.—Pernicious Anæmia. By ALEXANDER GOODALL, M.D., F.R.C.P. ..... 1160

**THE SERVICES.**

Royal Naval Medical Service.—Royal Army Medical Corps.—Indian Medical Services.—T.A. Ambulance Challenge Shield ..... 1167

**SPECIAL ARTICLES.**

University of Edinburgh: Opening of the Reconstructed Department of Surgery.—(*Illustrated*) . 1161

A Visit to Some of the West German Spas ... 1164

Paris: The Witness of Psychopaths ..... 1165

Budapest: Unsatisfactory Results with the Dick Test ..... 1166

Infectious Disease in England and Wales ... 1167

**CORRESPONDENCE.**

Thyroid Enlargement and the "Lack of Iodine" Theory (Dr. J. W. Fraser and Mr. A. R. Tankard) 1168

Cholecystogastrostomy for Gastric Ulcer (Mr. R. Leonard Ley) ..... 1168

The Treatment of Sciatica (Dr. M. Weinbren)..... 1169

Filigree in Hernia Operations (Mr. E. T. C. Milligan) ..... 1169

Listerism in Midwifery (Sir Francis Champneys) .. 1170

Autolytic Products and Malignant Tumours (Dr. Helen Chambers) .... 1170

Birth Injuries to the Eye (Drs. Ernest Thomson and Leslie Buchanan) . 1170

**OBITUARY.**

Sir William Boog Leishman, K.C.M.G., C.B., F.R.C.P., F.R.S.—(*With Portrait*)..... 1171

Sir Stewart Stockman, M.R.C.V.S. ..... 1173

**MEDICAL NEWS.**

University of London.... 1174

Wellcome Historical Medical Museum ..... 1133

Railway Concessions to Czecho-Slovakian Spas. 1133

Floating Rest Homes on the Volga ..... 1150

Complimentary Dinner to Prof. Fibiger ..... 1170

A Plaza Theatre Bed.... 1159

Prof. G. M. Robertson on Lunacy Certification... 1170

The late Dr. W. Hood ... 1174

University of London Club ..... 1175

Indian Medical Service Dinner Fund ..... 1175

The late Prof. Babák ... 1175

Royal College of Surgeons of England: Jacksonian Prize.—Cartwright Prize ..... 1175

Fellowship of Medicine and Post-Graduate Medical Association ... 1175

Royal College of Physicians, Edinburgh 1175

London (R.F.H.) School of Medicine for Women 1175

The Cripple Problem .... 1175

A Windfall for Dublin Hospitals ..... 1175

Ross Institute for Tropical Diseases ..... 1175

Royal Society of Medicine 1175

Retirement of the Registrar-General of the Irish Free State..... 1176

Tuberculosis Conference . 1176

Presentation to Dr. Herbert Jones ..... 1176

Royal Medical Benevolent Fund ..... 1179

Donations and Bequests . 1182

**PARLIAMENTARY INTELLIGENCE.**

House of Lords: Midwives and Maternity Homes Bill ..... 1176

House of Commons: Progress in Housing Construction.—Economy in Poor-law Relief.—Report of the Lunacy Commission.—Lead Paint Poisoning.—The Taxation of Medicines.—Health Conditions on Emigrant Ships.—Government Nominee on the G.M.C. ..... 1178

**NOTES, COMMENTS, AND ABSTRACTS.**

The Coal Crisis: Health of the Mining Community ..... 1181

Lebanon Hospital for Mental Diseases..... 1182

Medical Diary ..... 1180

Appointments ..... 1180

Vacancies ..... 1180

Births, Marriages, Deaths 1181

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BY HUGH MACLEAN, M.D. ABERD., D.SC. LOND., M.R.C.P. LOND.,

PROFESSOR OF MEDICINE, UNIVERSITY OF LONDON; DIRECTOR, CLINICAL MEDICINE UNIT, ST. THOMAS'S HOSPITAL.

## LECTURE I.*

THE subject of carbohydrate metabolism is of special interest, both from the point of view of the biological chemist and the physician. While the particular steps constituting the normal mechanism are of greater interest to the chemist, the breakdown of this mechanism gives rise to symptoms which are the special province of the clinician. It is chiefly from the clinical point of view that I wish to discuss the subject at present, but in order to get as clear an outlook as possible, it is necessary to mention briefly the present views on the fate of carbohydrate in the normal individual.

### CARBOHYDRATE METABOLISM IN HEALTH.

Under ordinary circumstances by far the greater part of our food consists of carbohydrate material taken in the form of starch. Whatever the nature of the starch may be, it is very quickly broken down in the gastro-intestinal tract and changed into glucose. As glucose it is absorbed into the circulation, to be finally oxidised and excreted in the form of carbon dioxide and water. In the healthy individual quite enormous amounts of starch can be ingested without any sugar being excreted in the urine. In some cases as much as 400 g. or more of glucose can be taken at one time without producing a trace of glycosuria, while the quantity of starch that can be ingested is very great indeed.

It is obvious that the normal body is exceedingly effective in dealing with carbohydrate, and that it is only when disease supervenes that any evidence of the excretion of ingested sugar is obtained. Of the various changes which sugar undergoes in the body we are more or less ignorant, and many of our present views are merely conjecture. Within recent years, however, some little light has been thrown on the subject, and though our knowledge is still very fragmentary and inconclusive, yet some very suggestive observations have been made. It is a curious fact that no matter how much carbohydrate is eaten, the amount of sugar in the general circulation is not increased except quite temporarily. Since sugar is utilised in the body and rapidly disappears as such from the tissues very soon after being taken, it is obvious that sugar must either be quickly converted into some other substance or that it must be equally rapidly destroyed as the result of the normal processes of oxidation.

#### *Conversion of Sugar into some other Substance in the Tissues.*

*Glycogen and Fat.*—It is well recognised that a large amount of the sugar ingested is stored in the body as glycogen. This storage takes place chiefly in the liver, but comparatively large amounts of glycogen are also found in the muscles. This glycogen-supply serves as a reservoir for the giving out of glucose when it is required for metabolism. That feeding with carbohydrate results in the formation of fat has been recognised for a very long time, but the general impression appears to be that this transformation of sugar to fat is a very slow one. All the available evidence points to the conclusion that once fat is formed it cannot be reconverted into sugar.

*Hexose-diphosphate.*—Many years ago Harden and Young showed that a combination of sugar with phosphoric acid was formed during the fermentation of sugar by yeast. Examination of this compound showed that it contained two molecules of phosphoric acid combined with one molecule of sugar.

Phosphoric acid
Phosphoric acid → Sugar (hexose).

The sugar obtained on hydrolysis of this compound was found to give the reactions of fructose. The importance of this phosphoric ester in the fermentation of sugar by yeast has been well recognised for a long time, but work carried out during the past few years has sufficed to establish the fact that in the metabolic processes of the muscle cell the formation of hexose-phosphate plays a no less important part. The detection of this substance in the animal organism is based on the work of Embden and his colleagues, who showed that when the fresh muscle-juice of a dog was left to stand, lactic acid very soon appeared. Naturally, for reasons which will be discussed later, it was thought that this lactic acid was probably formed from pre-existing glycogen or glucose, but it was soon established that no corresponding decrease of carbohydrate accompanied this formation of lactic acid. It was observed, however, that whenever lactic acid was formed, free phosphoric acid appeared, and that the amount of this phosphoric acid bore a very definite relationship to the lactic acid formed. Indeed, for each molecule of lactic acid there was found a molecule of free phosphoric acid. Now this is exactly what might be expected to happen if the mother substance was of the nature of the yeast hexose-diphosphate, for each molecule of hexose would form two molecules of lactic acid, at the same time liberating two molecules of phosphoric acid. It was proved, at any rate, that muscle-juice contained some forerunner of lactic acid other than glucose or glycogen, and to this substance Embden gave the name of *lactacidogen*. Subsequently, this product was isolated and shown to be identical with the hexose-phosphate obtained from yeast-juice by Harden and Young.

All recent work points to the conclusion that this tissue hexose-phosphate plays a most important part as an intermediate product in carbohydrate metabolism, and its formation appears to be an essential step in the breaking down of sugar. Though some suggestions have been made to the contrary, there is no evidence that its presence is necessary for the formation of glycogen from sugar.

#### *Oxidation of Sugar.*

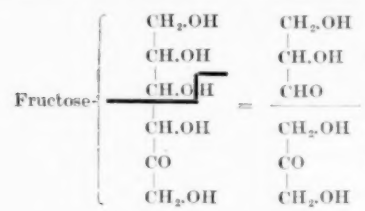
In discussing the various probable methods by which sugar might be broken down to its simplest products—carbon dioxide and water—it will be necessary to consider shortly the general structure of glucose. Glucose is a compound containing six carbon atoms; it consists essentially of a chain of five alcohol groups united to a terminal aldehyde group—CHO.

$$CH_2OH-CH.OH-CH.OH-CH.OH-CH.OH-CHO.$$

All the evidence we possess at present points to the conclusion that during oxidation this six carbon chain splits up into two products, each containing three carbon atoms. It is probable, however, that this happens after the formation of the hexose-phosphate compound already described in which the sugar apparently exists in the form of fructose. The split of fructose into two substances, each containing three carbon atoms, is best represented by a cleavage in the position shown in the diagram.

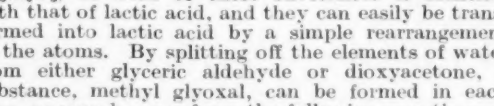
* Lecture II. will appear in a subsequent issue.

The two substances formed according to this view are glyceric aldehyde and dioxyacetone.

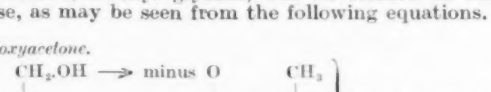



It will be noticed that the empirical formula ($C_3H_6O_3$) of each of these substances is identical with that of lactic acid, and they can easily be transformed into lactic acid by a simple rearrangement of the atoms. By splitting off the elements of water from either glyceric aldehyde or dioxyacetone, a substance, methyl glyoxal, can be formed in each case, as may be seen from the following equations.

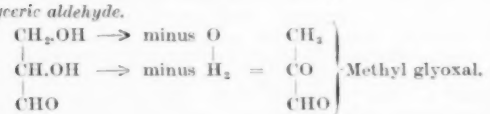
*Dioxyacetone.*




*Glyceric aldehyde.*




By adding on the elements of water in a different manner to methyl glyoxal we arrive at lactic acid.




The above represents a theoretical scheme by which the change from glucose to lactic acid through the intervention of hexose-diphosphate may be represented. It is worthy of note that the various reactions suggested do not involve any oxidation of the original compound. In the classical experiment of Hopkins and Fletcher it was shown that the actual production of lactic acid in muscle was an anærobic process. It is now necessary to consider what evidence there is that these theoretical changes actually take place in the body.

### *Evidence that such Intermediate Substances may occur in the Body.*

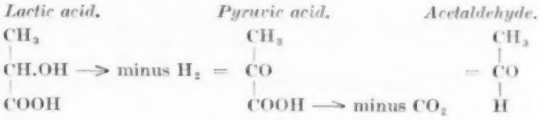
The proof that hexose-phosphate occurs normally in the animal organism has already been given. Convincing evidence was furnished by the experiments of Meyerhof that glucose added to minced muscle is converted into lactic acid *only in the presence of a solution of sodium phosphate.* The fact that phosphate is essential for this change suggests the view that the formation of hexose-phosphate is a definite and essential link in the chain.

With regard to the probable presence in the animal body of methyl glyoxal, it is significant that an enzyme capable of transforming methyl glyoxal with extraordinary rapidity into lactic acid has been shown to be widely distributed in the tissues by Dakin and Dudley. These observers found that this enzyme was not present in the pancreas, and further made the curious observation that the pancreas contained a substance which inhibited the action of this enzyme. This fact is of some interest when we consider the important rôle played by the pancreas in carbohydrate metabolism. Such is the wonderful activity of this enzyme that a crude aqueous extract of liver containing less than 1 g. of organic matter can form several grammes of lactic acid in the course of a few minutes. Under these circumstances it is obvious that the recovery of methyl glyoxal as such from the tissues could hardly be expected, for it would be immediately converted into lactic acid.

It has been clearly demonstrated by the work of Meyerhof that the glycogen of the tissues is the source from which lactic acid is formed, for according to this author the glycogen in muscle decreases exactly in proportion to the amount of lactic acid produced. A. V. Hill has made the fundamental observation that the heat produced when muscle contracts is evolved almost entirely during the relaxation of the muscle, and is caused by oxidation of a small proportion of the lactic acid produced during contraction, the remainder of the lactic acid being reconverted to glycogen. Apparently, we have, therefore, during muscular activity a reversible series of changes from glycogen to lactic acid and vice versa. In this series of changes hexose-phosphate seems to constitute an essential intermediate stage.

### *Oxidation of Lactic Acid.*

In the light of the above observations it seems fairly certain that lactic acid constitutes a definite intermediate product in the metabolism of sugar. It is known, however, as already indicated, that lactic acid can be completely oxidised in the muscles, and though it is not definitely proved that lactic acid must be always formed before complete oxidation of sugar takes place, yet there seems to be more support for this view than for any other. Until quite recently there was really no evidence as to the nature of the intermediate products derived from lactic acid, but the suggestion was advanced that lactic acid might change into pyruvic acid, and that the latter, by splitting off $CO_2$, might furnish acetaldehyde, which would then be further oxidised to water and carbon dioxide. The following formulæ represent these changes:—

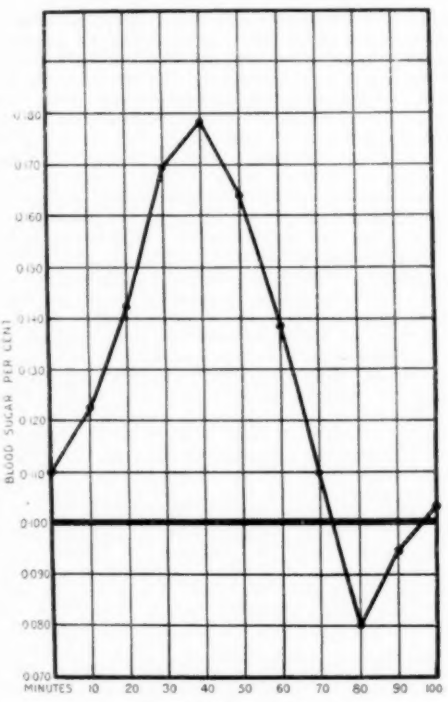



Two pieces of evidence have now been adduced to substantiate this view: (1) Neuberg has demonstrated the presence of an enzyme in yeast which liberates $CO_2$ from pyruvic acid, forming acetaldehyde. So many close analogies have now been shown between the course of carbohydrate fermentation in yeast and the carbohydrate metabolism in the body that this observation must be considered as at least suggestive. (2) Neuberg and Gottschalk have shown that the formation of acetaldehyde occurs as a normal stage in the oxidation of carbohydrate by muscle, and have actually isolated acetaldehyde from the tissues. More than this we cannot say. It is obvious that the gaps in the mechanism of carbohydrate metabolism still require a good deal of filling up, and that a good deal of what has been said above still rests on insufficient evidence. On the whole, however, the work of the last few years has done much to lay more solid foundations on which the future investigator may hope to build with success. The next point to consider is the variations which take place in the blood-sugar of normal and pathological subjects. Without some knowledge of these changes it is quite impossible to appreciate many of the more important facts concerning diabetes and glycosuria.

## THE AMOUNT OF SUGAR IN THE BLOOD.

It is now well recognised that under ordinary circumstances the blood-sugar content varies from time to time. This variation depends chiefly on the ingestion of carbohydrate. Apart from the temporary influence of food, the blood-sugar concentration is

wonderfully constant, and in man is roughly about 0·1 per cent. When, however, starch or sugar is taken in sufficient amount, the blood-sugar quickly rises, and in 30 to 45 minutes reaches a maximum value varying from about 0·16 to 0·18 per cent. It matters little whether ordinary glucose or some starchy material is taken. Within a very short period there appears this marked rise in blood-sugar content. This quick response indicates that the hydrolysis of starches in the gastro-intestinal tract must be an exceedingly rapid process. The changes in blood-sugar can be well studied by giving 50 to 60 g. of glucose dissolved in a few ounces of water and




A normal blood-sugar curve.

estimating the blood-sugar at frequent intervals. Very often the maximum concentration of blood-sugar is reached within 30 minutes after the ingestion of the glucose. From this point onwards the blood-sugar steadily falls, until in an hour or an hour and a half it again regains its normal level of 0·1 per cent. Indeed, not infrequently it actually sinks to a lower level than this, and after remaining at this low level for a short time quickly returns to the normal. Though slight variations of this phenomenon occur in different individuals, the general result is more or less as described. A blood-sugar curve obtained from a healthy individual is represented in the diagram here shown.

Now it is quite easy to understand why the blood-sugar should rise after taking starch or sugar by mouth. There is an increased absorption of sugar from the intestine into the circulation, and consequently a definite increase in blood-sugar would be expected. It is much more difficult to explain why this rise should be so quickly succeeded by a sudden fall. It might be argued that the bulk of the sugar had already been absorbed when the curve reaches its maximum, and that the fall in blood-sugar was simply an indication of this fact. That this is not the case is obvious for various reasons. It can be shown that when the curve has regained the normal level there may still be plenty of sugar in the stomach, and that absorption may be going on rapidly with the blood-sugar as low as 0·08 per cent. or so. Also, this sudden fall does not take place in the diabetic subject. It is therefore certain that when the curve begins to fall, some mechanism comes into play by which the absorbed sugar is removed from the blood. What is this mechanism? The question is a difficult one, but there are various possibilities. The sugar might be rapidly oxidised by the tissues. No doubt this factor plays a part in reducing the blood-sugar, for experiments show that there is an increase of oxidation of carbohydrate at this stage as indicated by the respiratory quotient rising to 1. It is possible, however, to calculate the maximum amount of sugar that could be destroyed in an individual from the time that sugar is ingested until the blood-sugar returns to normal. It is quite certain that the amount of sugar destroyed during this period accounts for but a small part of the total sugar absorbed. Again, it would be a most wasteful method that would destroy all the sugar immediately on its being absorbed. Indeed, it is very probable that actual destruction of sugar by the tissues plays but a small part in the rapid reduction of blood-sugar after a carbohydrate meal, for there are many patients who show normal powers to oxidise sugar, and yet give a typically abnormal curve.

No doubt gradual dilution of the sugar in the stomach has some effect, for Goldblatt has shown that when 50 or 60 g. of sugar are taken in a litre of water the blood-sugar does not rise to any appreciable extent. If the sugar is not destroyed the only possibility is that it is quickly converted into some other substance and stored as such. This is really what happens. When the blood-sugar reaches a certain concentration a mechanism comes into play which removes the sugar from the blood and stores it in the form of glycogen. This mechanism continues to act until the blood-sugar regains its normal level, however actively the absorption from the intestine is going on. Now it is well known that the chief depôts of glycogen are the muscles and liver. For various reasons it is my opinion that the chief site of this storage is the liver. This statement is based largely on clinical observations which indicate that whenever the liver cells are diseased or abnormal, the reduction of blood-sugar after a carbohydrate meal fails to take place in the usual way, or is very markedly interfered with. There is every reason to suppose that formation of glycogen in the muscles also plays some part, but it appears to be a subordinate one.

What happens therefore when carbohydrate is taken in sufficient amount is that the glucose passing into the liver by the portal system is at first allowed to pass through into the general circulation, but that after a time, when the blood-sugar reaches a certain concentration, the liver begins to hold back the sugar and to store it into the liver cells in the form of glycogen. The result is that the peripheral blood-sugar quickly falls. It is certain that the internal secretion of the pancreas (insulin) must play a definite part in this mechanism, but how it acts is at present far from clear. It might be argued that the initial increased concentration of sugar in the blood acts as a stimulus to the pancreas, and causes it to secrete insulin which is responsible for the phenomenon. There are some difficulties in accepting this view. Lævulose, for instance, is apparently stored in the liver immediately, for it does not raise the blood-sugar concentration. It is therefore difficult to see how this sugar can stimulate the pancreas, since it apparently never enters the general circulation; also it is apparently stored before any stimulation of the pancreas would have time to secrete the necessary insulin. Hewitt has shown that lævulose is more slowly absorbed from the intestine than glucose, but rate of absorption plays practically no part in preventing a rise in blood-sugar, since lævulose causes a marked rise in the diabetic subject.

Since lævulose is immediately changed into glycogen on absorption into the portal system, it is possible that glucose gradually becomes changed

into some isomeric substance having a structure closely allied to that of lævulose, and that it is this substance which the liver changes into glycogen. If it is true, as generally claimed, that the sugar of animal hexose-phosphate is lævulose, this fact might lend some support to the above idea.

Some years ago evidence was brought forward in favour of the view that the sugar present in the tissues of the normal individual was really not ordinary glucose, but an isomeric form more reactive than glucose—so-called γ glucose. This view has not been confirmed. In this connexion it was shown by Tallermann that the sugar excreted in the urine of the normal individual as the result of phloridzin administration was apparently ordinary glucose. Presumably this sugar passed in the urine must have possessed the same structure as the blood-sugar from which it was derived.

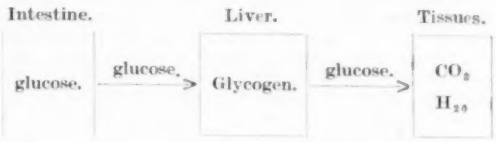
### THE RENAL THRESHOLD FOR SUGAR.

In ordinary circumstances practically no sugar passes from the blood into the urine as long as the blood-sugar concentration remains below a certain figure. In the average individual the kidney begins to let sugar pass whenever the blood-sugar content rises to 0·18 per cent. or so. It is an interesting fact that it is practically impossible in health to raise the blood-sugar to this point however much sugar or starch is eaten. Whenever the blood-sugar begins to approach this so-called threshold line the storage mechanism above described comes into action and prevents the sugar from reaching the critical point. But since no excretion of sugar by the kidneys takes place until the threshold is exceeded, it follows that glycosuria can only be produced with the very greatest difficulty, if at all, in the perfectly normal individual. There is really no such condition as the "alimentary glycosuria" of the text-books. Generally speaking, it does not matter how much sugar is absorbed, for the normal liver is capable of dealing with very large amounts, and so prevents the blood-sugar from rising sufficiently high to overflow into the urine. From this it is obvious that under ordinary circumstances, when a patient has glycosuria, his blood-sugar must at any rate be as high as 0·18 per cent.

In some subjects this threshold is placed at a much lower level, and occasionally it may even be below the normal blood-sugar value of 0·1 per cent. In these cases sugar passes into the urine whenever the blood-sugar rises to the concentration constituting the altered threshold. In other words, sugar leaks through the kidney constituting the condition known as *renal glycosuria*. This abnormality, which is now recognised to be so important from the clinical standpoint, will be discussed later. From this brief discussion of the changes which normally take place in blood-sugar concentration we may now pass on to a consideration of diabetes.

### "DIABETES."

Though one of the most striking features of diabetes is the presence of sugar in the urine, it must not be forgotten that diabetes indicates a breakdown in the metabolism not only of sugar, but of protein and fat as well. Unfortunately, in clinical work the term *diabetes* is used to include at least two entirely different conditions with the result that much confusion prevails. It is often stated that diabetes in the young is a much more serious condition than diabetes in the middle aged and elderly. This, however, does not appear to be strictly true. Typical diabetes is equally severe at whatever age it appears. How, then, are we to account for the well-known clinical fact that many elderly patients may pass sugar in the urine for years without any ill-effects, while glycosuria in the young is a much more severe malady? The answer seems to be that this chronic glycosuria of the elderly subject is not really diabetes at all. To understand the position fully it will now be necessary to consider the mechanism by which glycosuria is produced. When sugar is absorbed from the intestine it first passes into the liver and, as already shown, it is to a large extent stored there in the form of glycogen. When required the glycogen is reconverted into sugar and is ultimately oxidised by the body tissues. These points are indicated in the diagram.




Now it is obvious that marked glycosuria might be caused by (1) failure of the liver to convert the absorbed sugar into glycogen, or (2) failure on the part of the tissues to oxidise sugar. Either or both of these factors acting together would result in a marked hyperglycæmia with consequent glycosuria. In true diabetes, definite evidence of defective oxidation can easily be obtained. Thus ingestion of sugar in the diabetic subject does not generally cause an increase in the respiratory quotient such as is observed in the normal individual. Again, the diabetic subject shows evidence of defective fat oxidation as indicated by the presence of ketone bodies in the urine. In many elderly individuals with very marked glycosuria no evidence of defective oxidation of either sugar or fat can be obtained. No ketone bodies, or at most only traces of these substances, are present in the urine. These points indicate that there must be some fundamental difference between the glycosuria of the elderly individual and true diabetes. What is this difference? Many observations point very strongly to the view that this chronic glycosuria is largely dependent on the inability of the individual to store sugar in the liver. This results in an increase of sugar passing into the blood and giving rise to glycosuria. It seems certain that the power to store sugar may be very largely lost, while the power to oxidise sugar may be apparently quite efficient, and it is this lack of power to store that accounts for the so-called chronic diabetes of the elderly subject. This conception explains many puzzling clinical features such as the lack of definite symptoms so often observed. Nutrition is well maintained, and though the condition is generally called diabetes, it should really be differentiated from true diabetes.

#### *Cause of Defect in Storage.*

Everybody is now agreed that normal carbohydrate metabolism is dependent on the secretion of insulin by the pancreas, and the wonderful effects of insulin in the treatment of diabetes lend ample support to this view. There seems no doubt whatever that true diabetes arises from a disturbance in the pancreas resulting in an insufficient supply of insulin to the organism. On casual consideration we might suppose that lack of storage of sugar is also necessarily connected with some pancreatic defect, but this is by no means quite clear. If defective storage were always due entirely to an insufficient supply of insulin, it is strange that patients showing marked glycosuria and with very little power to store sugar, frequently go on for years and years without showing any evidence whatever of the slightest defect in oxidation. It might be thought that in severe cases of this type of glycosuria some evidence of definite oxidation would be obtained if storage and oxidation of sugar were entirely dependent on the same factor. The clinical evidence, indeed, strongly supports the view that whatever part the pancreas may play, there is another factor present which is of very great importance. This factor seems to be connected with some change in the liver. At present our thoughts and ideas are so centred on insulin that we are liable to forget that the metabolism of sugar in the body requires not only insulin, but a specially organised tissue through which insulin acts. Insulin alone will neither oxidise sugar nor convert it into glycogen;

another factor is necessary which is inherent in the tissue itself. Now it is very probable that under certain circumstances the tissue cells may lose, to some extent, their power to form glycogen, even when the normal amount of pancreatic secretion is available. It is a striking clinical fact which has been noted again and again, that the glycosuria of the elderly subject is very frequently associated with some pathological changes in the liver. I am not unmindful of the fact that such hepatic changes may often be associated with pancreatic changes as well, but, for the reasons already given, pancreatic changes by themselves hardly account for the condition. The most reasonable view to take, in the light of our present knowledge, is that the so-called chronic diabetes of the elderly subject is associated with some changes in the liver, and that whatever part the pancreas plays in this connexion, a pancreatic lesion is not the sole and probably not the most important factor. The condition generally referred to clinically as diabetes may therefore be classified under two types: (1) hepatic glycosuria (the chronic diabetes of the elderly subject), and (2) true diabetes.

### *Hepatic Glycosuria of Elderly Subjects.*

Though the glycosuria present in this condition is often very marked and intensive, it frequently happens that practically no other symptoms are found. When the malady has persisted for a considerable period, certain symptoms frequently appear, but they are usually of a somewhat different nature from those associated with typical diabetes. Thus, there is little or no acidosis and no tendency to coma. Not only is nutrition in general well preserved, but patients are often abnormally fat. Sometimes, however, the large loss of sugar results in some decrease of weight. In this type of case the symptoms that may arise appear to be definitely dependent on the excessive amount of sugar in the blood.

The most important results of this hyperglycæmia are: (1) local irritation; (2) cramps and pains in the joints; (3) neuritis; (4) eye changes; and (5) general weakness and mental irritability. Of all these symptoms, local irritation produces, perhaps, the greatest discomfort, especially in women. The continued irritation sometimes experienced is so intense that patients have been known to commit suicide. Cramps and pains are often very troublesome, and may be so severe as to be mistaken for the pains of locomotor ataxy. In all cases, therefore, in which severe pains of doubtful origin are present it is well to examine the urine. Neuritis is, unfortunately, very common. Eye changes may be so extensive as to lead to actual blindness, and general muscular weakness may be well marked. It is safe to say that none of these symptoms can be ameliorated unless steps are taken to reduce the excessive blood-sugar. When this is done it is wonderful how some of these ailments disappear in a comparatively short time. I have known a patient who had suffered with very severe pains in his legs and shoulders for over two years, and, who for some weeks before treatment, was reduced to a pitiable state owing to suffering and lack of rest at night. On giving him a suitable diet all the pains entirely disappeared within ten days. The result of treatment is not always so dramatic as this, but perseverance generally has its reward in these cases. The onset of eye symptoms always suggests immediate and persistent treatment.

### *Prognosis in Hepatic Glycosuria of the Elderly.*

Very often the condition goes on for 20 years or more without getting much worse, and the patient dies of some other disease. Frequently, after a certain number of years, some of the symptoms just mentioned develop to such an extent that definite treatment becomes necessary. In a few cases, after many years of harmless glycosuria, the patient more or less suddenly develops the usual symptoms of typical diabetes. He wastes rapidly and loses weight; the urine, which was formerly free from ketone bodies, now contains large amounts of acetone with diacetic and oxybutyric acids; his condition becomes grave and coma threatens.

How are we to explain this sudden change? I think that the most rational view is that the persistent hyperglycæmia had after many years worn out the pancreatic islet tissue with the result that the necessary amount of insulin ceased to be secreted. It has been abundantly proved by the work of Allen that continued high blood-sugar tends to exhaust the pancreas and cause diabetes. In these cases of prolonged glycosuria in the elderly, the wonder is that the pancreas is not worn out more frequently than is actually the case. The fact that marked hyperglycæmia continuing for many years does not usually exhaust the pancreas to the point at which ordinary diabetes supervenes, seems to me to be another proof that a primary pancreatic defect is not the chief factor in this form of diabetes. Indeed, it might be argued that in these cases the special islets of the pancreas are particularly healthy to begin with, and therefore very resistant to the detrimental effects of hyperglycæmia.

If we remember the above distinctions between the diabetes of the elderly individual and true diabetes, it helps us to get a rational view of the position. When true diabetes occurs it is as acute in the elderly as it is in the young, but since true diabetes is probably always associated with a pancreatic defect, its development must often mean that the pancreatic islets were fundamentally weaker than normal to begin with. Naturally, such weakness would be likely to show itself in youth; if a subject lives to an advanced age without showing any evidence of diabetes, this, of itself, signifies that he must have inherited a sound pancreas. Any defect would almost certainly have been found out early in life. It is thus obvious that true diabetes is more likely to develop in the young, while diabetes at the other end of the scale is more likely to show itself after a considerable strain on the pancreas from hyperglycæmia. The glycosurias of the elderly are not diabetic at all, and in the light of what has been said there is no reason to believe that true diabetes is not equally severe at all ages.

In the next lecture I shall discuss renal and other forms of glycosuria, acidosis, the diagnosis of diabetes, diet in diabetes, and some experiences with insulin.

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WELLCOME HISTORICAL MEDICAL MUSEUM.—The Museum at 54A, Wigmore-street, W., was partially reopened on June 1st, but the work of reorganisation is still proceeding with a view of making the collections more accessible for inspection and study. The museum is open to members of the medical profession, chemists, pharmacists, nurses, and research workers generally from 9 A.M. to 6 P.M. on week days, Saturdays 9 A.M. to 1 P.M.

RAILWAY CONCESSIONS TO CZECHO-SLOVAKIAN SPAS.—Visitors to the various Czecho-Slovakian spas and health resorts will be granted a special reduction of 50 per cent. on the cost of their railway journeys within the Czecho-Slovak Republic. In order to secure this concession, which supersedes all previous arrangements of this kind, visitors must remain for at least ten days in any one spa, where they should apply to the spa administration before starting on their return journey.

# Presidential Address
ON THE
# PRESENT POSITION OF CHLOROFORM.

*Delivered before the Scottish Society of Anæsthetists at Dundee*

BY ARTHUR MILLS, M.D. ST. AND.,

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DOUBTLESS we have been slow in this district to accept the view that the administration of anæsthetics is work requiring special skill and experience, for it is only within very recent times that the staff of anæsthetists in our hospital has been adequately increased. There are now six anæsthetists, a number sufficient to overtake practically all the work that is being done. I fear, however, that a long time may yet lapse before there will be a like demand for the services of the anæsthetist in private practice. Strange as it may seem, many a doctor still holds the opinion that "anyone can give chloroform." The economic factor, too, is, I fear, strong enough to perpetuate the old custom, and we may accept the fact that for some time to come many private patients will be anæsthetised by comparatively inexperienced administrators. It is with this fact constantly in mind that I have framed the views and opinions which I am about to express.

## CONFLICTING VIEWS AS TO CHLOROFORM.

Frequently in the past the value of chloroform as an anæsthetic has been discussed. In 1919 Dr. Paton Boyd took this subject for his presidential address and severely criticised the extreme attitude of the American anæsthetists. The Committee of Anæsthesia of the American Medical Association reported in 1912 that the use of chloroform was no longer justifiable, and that its use for minor operations should cease, but that it was sometimes of convenience for inducing anæsthesia in alcoholics or in difficult cases. In some places it would appear that chloroform has been entirely discarded. During 1923 17,813 anæsthesias were administered at the Mayo Clinic, and chloroform was not used on a single occasion.

Are we prepared to define clearly our own views on this important subject? When that report was issued by the American Medical Association in 1912 chloroform was practically the only anæsthetic used in Dundee and the surrounding district for all ordinary operations; indeed, we were not asked to give an anæsthetic, we were asked to "give chloroform." Though many practitioners now realise that there are certain limitations to the use of chloroform, and that other and safer anæsthetics are available, others persist in the belief that, provided with nothing but chloroform, they are justified in proceeding to induce and maintain anæsthesia wherever and whenever general anæsthesia is required. Chloroform deaths thus still take place, and by "chloroform death" I mean a very definite form of fatality. I suggest that our knowledge of the pharmacological action of chloroform and other anæsthetic drugs is now such that these deaths are avoidable, and that we as teachers of anæsthetics are responsible for inculcating better and safer methods. Such methods, however, must be simple, and not associated with the use of complicated apparatus, if they are to be adopted by the practitioner desirous of giving an anæsthetic only when the necessity arises in his own practice. Some such simple method I shall attempt to describe, but before doing so I should like to discuss briefly the manifest contra-indications to the use of chloroform.

## CONTRA-INDICATIONS TO THE USE OF CHLOROFORM.

Chloroform, of course, possesses certain obvious advantages. It is a powerful anæsthetic and easy to administer. A few cubic centimetres of chloroform administered on a towel or piece of lint are sufficient to produce anæsthesia. It is non-irritating to the respiratory passages and is pleasant to inhale. It produces a quiet type of anæsthesia and no undue congestion of the incised parts.

The dangerous effects of chloroform fall into four groups: (1) depression of the respiratory centre; (2) fall in the blood pressure; (3) late toxic effects—delayed chloroform poisoning; (4) chloroform syncope—death occurring very suddenly, usually, but not invariably, in the stage of induction.

I have not mentioned these groups in the order of their importance, the most important one being group 4, which I should prefer to discuss last.

(1) Chloroform has a depressant effect upon the respiratory centre. It dulls this centre's sensitivity to its normal stimulus from carbon dioxide. During anæsthesia the amount of carbon dioxide produced in the body is considerably reduced, and if at the same time the centre become less sensitive a condition of anoxæmia may result from deficient ventilation of the lungs. This danger is further increased by the fact that chloroform also reduces the oxygen-carrying capacity of the red corpuscles. Depression of the respiratory centre is usually of gradual onset and manifests itself in an unmistakable manner. The careful and observant administrator rarely permits the condition to become serious. Moreover, depression of the respiratory centre is not an effect peculiar to chloroform. The other anæsthetic agents have a similar action, but in less degree. It cannot thus be regarded as a factor of sufficient importance entirely to contra-indicate the use of chloroform.

(2) Chloroform in full anæsthetic doses causes a fall in blood pressure, and this fall is roughly proportionate to the depth of anæsthesia reached. The low blood pressure resulting from chloroform anæsthesia is similar in nature to that of surgical shock. It is not due to failure of peripheral resistance, for the arterioles are in a state of constriction. It is due to an imperfect filling of the heart in diastole and consequent diminished output into the arterial circulation with a stagnation of blood in the splanchnic area and in the capillaries. A tame rabbit suspended by the ears passes into a state of shock and dies. This condition of gravity shock is much more easily produced in the chloroformed animal than in the animal which has not been chloroformed, and is the more easily produced the more deeply the animal is anæsthetised. It has been shown that quantities of histamine too small to produce any effect upon a normal animal cause a marked fall of blood pressure when injected into an animal after prolonged chloroform anæsthesia. The histamine-like bodies produced when tissues are injured are believed to be the chief cause of shock, so that this action of chloroform in increasing the susceptibility of the tissues to histamine will also account for its predisposing to shock. Chloroform is thus strongly contra-indicated in cases where the patient is already suffering from a low blood pressure. In this respect patients suffering from shock or who are in a gravely debilitated condition are unsuitable subjects for chloroform anæsthesia.

(3) Post-anæsthetic toxæmia may follow the administration of any anæsthetic, but is much more frequent after chloroform. The condition is also known as delayed chloroform poisoning, and its symptoms are familiar to all of us. It is much more common in children than in adults, and toxæmia and starvation are powerful predisposing factors. It is a condition of acid intoxication comparable to that met with in diabetes, salicylate poisoning, and recurrent or cyclic vomiting. Acidosis or acid intoxication is due to the presence in the circulation of an abnormal amount of substances of the acetone group, and this excess may be due to too rapid formation or to too slow elimination,

or to both. Acetone bodies are the result of increased fat metabolism, which again is a result of the diminution in the carbohydrate metabolism. Elimination is performed by liver and kidneys, and deficient elimination results from damage to liver and kidney cells. Starvation and constipation and anæsthesia increase fat metabolism and increase acetonæmia. Septic absorption and chloroform damage liver and kidney cells. Clinically we find that the child who is suffering from a septic abdomen and who has had little or no food for a few days prior to operation is the most susceptible of all patients to post-anæsthetic acidosis. Chloroform is absolutely contra-indicated in these cases. It is also contra-indicated in the case of children known to suffer from cyclic vomiting. Such children may have a severe and fatal attack precipitated by a very short administration of chloroform. There is no evidence that chloroform produces an increased acetonæmia more readily than does ether. In this respect anæsthesia and asphyxial conditions are closely related. There is, however, strong evidence that chloroform, by its toxic effect on the liver and kidney cells, is much more dangerous than ether, and the acetonæmia produced is maintained and aggravated through deficient elimination. Beesly, in 1906, referring to work in the Children's Hospital in Edinburgh, reported that "out of 19 cases of acute appendicitis operated on under chloroform 14 died; out of 24 cases operated on under ether only 2 died, and that not as the result of acid intoxication."

### DANGERS DURING THE INDUCTION PERIOD.

(4) The large majority of chloroform deaths (80 per cent. or more) take place during the induction period. The victim is not infrequently a robust adult male. As an example of what may be regarded as a typical chloroform death, I quote the following case:—

> The patient was an ex-soldier, 53 years of age, who had had 30 years service abroad. He was of spare muscular frame, arteries hard, chest somewhat emphysematous and rigid, heart sounds could only be faintly heard, but his general condition was good. The operation intended was stretching the sciatic nerve. Anæsthesia was induced with chloroform on an open mask. The stage of excitement was very prolonged with violent struggling, spasm of the muscles, irregular respiration, and some cyanosis. Suddenly there was general muscular relaxation and the breathing lost its spasmodic character. The anæsthetic was at once withdrawn. Then followed a few deep regular respirations, but the breathing soon became shallow and stopped, the pupils being widely dilated and the complexion of a livid hue. No pulse could be felt at the wrist and the heart sounds were inaudible. Attempts to resuscitate the patient failed.

It is obvious that the patient's heart had suddenly ceased to beat and respiration only stopped after the respiratory centre had failed from want of blood.

I believe that I am correct in stating that a similar sequence of events never takes place when ether is the anæsthetic employed. Of a series of 33 chloroform deaths which I have investigated I find that at least 21 were of this nature. Such deaths are due entirely to the misuse of chloroform, and should cease to take place if our teaching is sound and is honestly followed. Of the several rival theories advanced to account for these sudden chloroform deaths, two only appear to me to be of value and to be more or less supported by clinical experience. Violent excitement in the induction stage will be admitted by all to be a frequent precursor to a catastrophe. In the series of cases investigated this state of excitement was emphasised in the report in 12 out of the 21, and may, of course, have occurred in others. Pohl found in a dog which had been killed by a few breaths of concentrated chloroform vapour that the blood in the left ventricle contained 0·2 per cent. chloroform, whilst that in the right ventricle contained only 0·02 per cent. He suggested, therefore, that in many cases death was caused as follows. During the stage of excitement and irregular spasmodic respiration the patient first held his breath and allowed chloroform vapour to accumulate under the mask; then he took a deep breath inhaling a concentrated chloroform vapour which passed into the blood and went direct to the heart and coronary arteries. In this way a toxic action upon the heart was produced long before the other tissues of the body were saturated with the drug. This theory would appear to fit in with a number of reported cases and could reasonably be applied to 12 or more of my series of 21. Levy, on the other hand, maintains that this theory has no experimental support, and states that high percentages of chloroform administered to animals are incapable of producing sudden stoppage of the heart. The matter would appear to require further investigation.

### VENTRICULAR FIBRILLATION AS A CAUSE OF CHLOROFORM DEATH.

In 1889 MacWilliam brought forward a new view as to the causation of sudden death by a previously unrecognised form of failure of the heart's action—namely, a condition of sudden ventricular fibrillation. It would appear to be not only a common cause, but the usual cause of sudden and unexpected death of cardiac origin, such as we meet with in cases of angina pectoris, sometimes after operations, and frequently where no pathological condition was suspected, but the individual is engaged in some form of violent exercise. Such deaths also frequently accompany or follow some emotional state. Ordinary cardiac or myocardial failure is a progressive exhaustion of the contractile power of the cardiac muscle and death is then by no means sudden. Sudden loss of contractile power does not occur. When ventricular fibrillation supervenes, on the other hand, we have a sudden disastrous change occurring in a cardiac muscle that may have been showing no symptoms of ordinary cardiac failure. There is an abrupt replacement of the effective systole by a continuous incoördinated activity in the muscular fasciculi, so that some are contracted and others relaxed, the result being a mere quivering of the ventricular walls with complete loss of any expulsive power. The result to the organism is the same as that of absolute stoppage of the heart's action. Unlike auricular fibrillation ventricular fibrillation is promptly fatal.

As the exciting cause of this condition MacWilliam emphasises muscular exertion, and especially when associated with emotional excitement. Sudden deaths of this nature take place during or very shortly after exertion. Muscular effort involves an increased demand upon the heart. Emotional excitement does the same. The amount of work that the heart is called upon to do per minute is enormously increased. There is an increased force and frequency of the heart beat, and the blood pressure is raised, giving a greater resistance. Conditions producing a susceptibility to ventricular fibrillation are tabulated by MacWilliam as follows: Altered nutritive conditions in the heart muscle as in coronary obstruction; toxic agencies such as typhoid fever and diphtheria; certain chemicals such as digitalis, barium salts, many other chemical compounds, and chloroform. The relation of chloroform anæsthesia and susceptibility to ventricular fibrillation has been worked out both by MacWilliam and by Levy, more particularly by the latter, and on the main points these two workers are in practical agreement. They have demonstrated that in healthy animals, cats particularly, a great susceptibility to ventricular fibrillation may be established by the administration of chloroform. Chloroform produces the state of susceptibility, and fibrillation is then easily produced by various forms of stimulation of the heart. Levy further insists that light anæsthesia is an essential condition, and that under deep anæsthesia a fatal result cannot be obtained. The forms of stimulation that produce fibrillation are: cutting the vagal trunks in the neck, the injection of one minim of 1 in 1000 adrenalin into a vein, direct excitation of the sympathetic nerve-supply of the heart, the stellate ganglion or the accelerator nerve, and stimulation of the cut ends of sensory nerves. Extreme deprivation of oxygen may have a similar effect. Furthermore, ventricular fibrillation may be initiated during a fit of struggling

in a cat under light chloroform anæsthesia, comparable in all respects to the familiar stage of excitement and struggling in the human subject.

Levy constantly lays emphasis on the lightness of the anæsthesia which is required in these experiments, and insists that the heart is more susceptible under light chloroform anæsthesia than under deep anæsthesia. It is difficult to believe that a low percentage of chloroform in the blood can do more harm to the heart than a higher percentage. To produce the state of ventricular fibrillation it is evident that there must first be a condition of susceptibility and then an exciting cause. May it not be possible that in deep chloroform anæsthesia the heart is more susceptible but the exciting cause is absent? We know that chloroform is a powerful cardiac depressant, and that in every case where it is administered the contractile power of the heart is weakened and its walls dilate. A call upon the heart under these conditions to beat with greater force and frequency means an enormous extra strain, for the force required to empty its ventricles increases as the cube of the radius. Stimulation might thus only excite fibrillation if that stimulation succeeded in producing an effort on the part of the weakened heart to beat with greater force and frequency. If the anæsthesia be deep it is conceivable that excitability of the heart would be so depressed with chloroform that it would make no effort in response to a stimulus, and the fatal disturbance to its action would not then take place. Levy's work is interesting, and I think of great value, but his manner of application of his results to practical anæsthetics is unfortunate. His teaching is entirely at variance with clinical experience. He constantly emphasises the danger of light chloroform anæsthesia, yet he does not define what he means by "light chloroform anæsthesia." The use of the expression "death due to light chloroform anæsthesia" is in my opinion unjustifiable. It conveys, moreover, the wholly false and dangerous doctrine that safety would have been found in giving more chloroform.

One must admit on study of the writings of these two workers that they have established strong evidence in favour of ventricular fibrillation being the cause of these sudden chloroform deaths. One must also conclude, however, that Levy's or, indeed, anyone's "principles of the safe administration of chloroform" are futile, and that it is quite impossible with our present knowledge always to render safe the administration of this drug.

I take it, therefore, that our teaching must be that the use of chloroform as an anæsthetic agent is not justifiable: (1) In cases of grave debility with low blood pressure, and more particularly in cases where the patient is suffering from shock. (2) In cases likely to develop acidosis, the most susceptible being the diabetic, the sufferer from the septic abdomen (the more especially if the patient be a child), and children who are the subjects of cyclic vomiting. (3) In a great many cases during the induction period.

Unlike our friends in America, I would not countenance its use during the induction period in alcoholics and difficult cases. Alcoholics and difficult cases are just those cases where a fatal result is to be looked for if chloroform be so employed. We must deal with our alcoholics and our difficulties in some other way. We must impress upon our students that to continue to administer chloroform to an excited and struggling patient cannot be made a safe proceeding, and that it is unnecessary, and therefore unjustifiable. We must teach our students other and safer methods.

### A SIMPLE METHOD FOR GENERAL USE.

Possibly cases of labour offer the one exception to a rule which I believe should be strictly adhered to, and that rule is—that no one should proceed to produce full surgical anæsthesia supplied only with the means of administering chloroform. As a routine method suitable for the general practitioner and house surgeon to use, and combining simplicity with safety, I advocate induction with the drop bottle and mask, and as a minimum of equipment, the administrator must be provided with chloroform and chloroform mask, ether and ether mask, a container of ethyl chloride of the type for general anæsthesia, and the usual tongue forceps, prop, and so forth. As we have seen, cases will be met with where chloroform is absolutely contra-indicated at any period in the administration. He should therefore be able to induce and maintain anæsthesia with ether alone by the open method, and should understand the value of previous medication with atropine and morphine. When not so contra-indicated chloroform can be administered with advantage up to the second stage, a change being made to the ether mask and ether as soon as the first sign has appeared that the stage of excitement has been reached. Full anæsthesia must be induced now with ether, aided, if necessary, by the addition of a little ethyl chloride on the ether mask. Chloroform must not be resumed till full anæsthesia has been reached, and only then if the nature of the operation favours a chloroform anæsthesia. The administrator will in the induction period frequently find it advantageous to change from chloroform to ether before the stage of excitement has been reached; he must never be tempted to delay the change after that stage has been reached. I do not hesitate to recommend this method, and for the following reason: its simplicity is obvious, and no cumbersome or perishable apparatus is required. I have never observed any alarming effects to accompany the administration of chloroform in a dilute and gradually strengthened vapour up to the stage indicated. Such a procedure has much to be said in its favour. Chloroform is a more pleasant vapour than ether to inhale. The sense of smell is quickly lost and the upper respiratory passages soon become dulled and less sensitive to the irritating effects of the pungent ether vapour which is to follow. In this way we eliminate a distressful experience for the patient, and we frequently avoid the coughing and salivation which are so prone to accompany the earliest stages of induction with ether. The safety of this method has been confirmed to my satisfaction over a period of eight years, comprising about 25,000 administrations.

### MORTALITY STATISTICS.

I have studied the reports of deaths under an anæsthetic occurring in the Dundee Royal Infirmary from 1904 to the end of 1923. I chose this period because 1904 appears to have been the first year that records were preserved, and the end of 1923 marks the end of that period when anæsthetics were given very largely by the house surgeons. Thereafter the staff of anæsthetists was very much augmented, and the records accordingly cease to have the same significance. The results of this investigation not only confirm the views which I have expressed, but justify me in continuing to inculcate the doctrines which I have laid down. From 1904 to 1916, when full induction with chloroform was the rule, the death-rate was 1 in 910 cases. From 1917 to 1923, when the methods I have described were largely followed, the death-rate was 1 in 7400 cases. Moreover, the deaths occurring in this latter period, three in number, would probably have been avoided had the administrator been able to proceed according to the newer teaching.

The reports number 43. In 10 cases the report definitely stated that death was due to some cause other than the anæsthetic. In several instances this was undoubtedly the case, as, for example, when death took place from hæmorrhage from the superior longitudinal sinus. In others the opinion was not so apparently well founded. When it was stated, for example, that death was not due to the anæsthetic but to the shock of the operation, and chloroform was the anæsthetic in use, one feels inclined to attribute to the anæsthetic some share, at least, in the production of the state of shock. In the majority of these 10 cases it was, however, obvious that the patient was moribund before the anæsthetic was administered. We are thus left with a series of 33 cases where, according to the report, death was due to the anæs-

thetic. Chloroform was the anæsthetic in 29, and a mixture of chloroform and ether in 4. Twenty-one were due to chloroform syncope in the stage of induction, the occurrence of excitement and struggling being emphasised in 17 of these. In 2 cases the Vernon Harcourt inhaler was being used; 5 were due to chloroform syncope during the operation; 4 were due to chloroform producing or contributing to a state of shock. The anæmic condition of the patient previous to operation was emphasised in three reports. Three reports were much too vague to permit of forming a definite opinion. In no case could death be attributed to a pure depression and final arrest of the respiratory centre. No statistics regarding delayed chloroform poisoning could be obtained.

In arranging my facts concerning the pharmacological action of chloroform I have borrowed freely from the following works: MacLeod's "Physiology and Biochemistry in Modern Medicine," Clark's "Applied Pharmacology," Levy's "Chloroform Anæsthesia," and Hewitt's "Anæsthetics and their Administration."

# THE PATHOLOGICAL ACTION OF LIGHT UPON THE EYE.

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## PART I.*—ACTION ON THE OUTER EYE: PHOTOPHTHALMIA.

THE acute inflammatory reaction of the superficial parts of the eye to short-waved light, called photophthalmia by Parsons in 1913, has been known and recognised from very early times; Xenophon, in his Anabasis (iv., 5) mentions one of its forms—"snow-blindness." Its first mention in scientific literature seems to have been by Faucault in 1843, and from the medical point of view it would appear to have received its first adequate notice from Charcot, who, in 1858, detailed the distressing experience of two chemists, who, "after making some experiments on the fusion and vitrification of certain substances by the action of the electric battery . . . found in their eyes a feeling of severe irritation that evening and during the whole night, which they passed without sleep." After the general introduction of the electric arc for furnaces and lighting in 1879 the occurrence of the typical symptoms became quite recognised, and to-day they are probably to be met with most commonly as an accident among those who work clinically and experimentally with ultra-violet rays, or who are subjected to exposure to the short-circuiting of a high tension electric current, or any other source rich in short-waved light. The earlier writers, attaching much importance to the functional visual disturbances which usually accompany such exposures, attributed the inflammatory trouble to reflex or sympathetic influences from the retina (Terrier, 1888; Martin, 1888), but in his classical experimental researches in 1889 Widmark established the ætiology of the disease as we now recognise it, and, correlating the experimental and industrial troubles with those met with under natural conditions as in "snow-blindness," he showed that the common cause was the shorter ultra-violet waves.

### *Pathogenesis.*

The experimental production of photophthalmia has been studied amongst others by Birch-Hirschfeld, Parsons, Martin, and Verhoeff and Bell, whose findings have been largely confirmed by the writer, working under the direction of Leonard Hill.

The biological action of light upon the eye, as elsewhere in the body, varies with the wave-length; the longer waves, by increasing molecular movement, produce mainly a thermal effect, the shorter ones, whose frequencies correspond to the intra-molecular oscillations, by increasing atomic motion, produce molecular disintegration, with consequent photoabiotic, photochemical, and photoelectrical changes. Unless radiant energy is absorbed it can exert no effect, pathological or otherwise, upon the substance through which it is passing; it is therefore with the light that is absorbed by the cornea that we are concerned.

The absorption of the cornea has been studied by a large number of investigators, whose results agree so closely that the matter may be considered as settled. The cornea, apart from radiations at the extreme end of the energy spectrum (electrical oscillations), completely absorbs heat waves longer than 20,000 Angström units; below this in the infra-red, part are absorbed and part are transmitted, the amount of the latter increasing until at 7500, just at the commencement of the visible reds, practically all are transmitted; thereafter, throughout the entire visible spectrum, it is almost completely transparent, the small amount of absorption which exists being determined largely by the lamellæ and the corpuscles causing internal reflections and refractions. This obtains down to the region of 3150 in the ultra-violet, when absorption again becomes considerable, the process becoming complete at about 2910. The lines of demarcation are not sharp, and the limits vary to some extent between individuals, and to a greater extent, and probably exponentially, with the intensity of the incident radiation, but for all practical purposes the lower limit of transmission may be taken as at 3000 A.U. Transparency again occurs at the extreme lower limit of the known spectrum, in the region of wave-lengths of the order of one A.U. (X rays, gamma rays). The absorption of the conjunctiva corresponds to that of the skin; all incident energy within the limits of the spectral range of ordinary sources is absorbed very rapidly, the abiotic rays being completely absorbed at a depth of about 0·1 mm., the heat effect of the luminous waves penetrating to the submucous tissues.

The rays producing symptoms of photophthalmia are the shorter ultra-violet. Theoretically energy of any wave-length should be able to produce some degree of abiotic action, but in living tissues any very slight and slowly produced changes that the longer waves may effect are either made good by the process of physiological repair or are masked by a preponderating thermal effect. A critical threshold both of wave-length and of intensity of radiation therefore exists. It has been established by the use of suitable filtering screens of graded degrees of transparency that the limiting wave-length which is able, in the intensities usually employed experimentally, to produce an inflammatory effect upon the cornea and conjunctiva is 3050 A.U. (Verhoeff and Bell). The effect in this region, however, is very small, and to cause any marked reaction radiation must be employed in considerable intensity and over a long period of time; for all practical purposes it is the rays below 3000 which are responsible for exciting the condition, the most potent being those from 3000 to 2500. This corresponds with the limits of sensibility of the skin, as determined by Leonard Hill, Hausser, and others. Above this critical limit all the incident energy which is absorbed is converted into heat, producing when in quantity sufficient to cause pathological changes, a thermal effect. This effect as far as the cornea is concerned, on account of its great transparency, is practically negligible for all ordinary intensities of radiation throughout the visible spectrum, until we come to the infra-red.

Since the disturbance is the direct result of the absorption of energy, not only is there a critical wave-length, but there is also a very definite critical quantity of effective energy required to set up a reaction, and the knowledge of its magnitude is of

* Parts II. and III. will appear in subsequent issues.

importance in deciding the dosage appropriate for the local treatment of diseased conditions. In the rabbit an exposure of 2·5 minutes at a distance of 0·5 metres from a quartz mercury lamp (K.B.B., atmospheric pressure running at 200 volts, 3 amps.) is required to produce definite signs of conjunctivitis and stippling of the cornea; this represents a total abiotic energy incidence, expressed in biological units (Hill and Eidinow), of approximately 2 I.K. (infusoria killing) units, or about 2,000,000 erg-secs. per square centimetre. Allowing for slight variations due to individual idiosyncrasies—thus blonde people are usually more susceptible than dark—the human eye is more sensitive than that of the rabbit, a difference which may in part be due to the more ready elicitation of subjective symptoms. An average exposure under the same conditions of slightly less duration induces slight symptoms (i.e., a dose of approximately 2 I.K. units), which again corresponds with the minimum dose found by Hill and Eidinow to be necessary to produce the faintest appreciable erythema on the skin.

The degree of reaction varies, moreover, with the intensity of the energy involved. Thus with a source of uniform intensity it varies, within limits, directly as the time of exposure, and inversely as the square of the distance of the radiating source from the eye. In this way an exposure of ten minutes under the above conditions produces a very marked conjunctivitis in rabbits, and after 15 minutes there is complete desquamation of the corneal epithelium, while the effects at 0·5 metre correspond in degree to those received in an exposure of four times the duration at 1 metre. Further, the effect of repeated exposures with intermissions is the same as their equivalent as a single long exposure, always provided that the time interval between them is not of duration so long that the factor of physiological repair comes into play. Up to 24 hours the effect of repeated exposures may thus be considered additive.

The relation to the intensity of energy is also seen in the site of the lesion on the cornea; in mild cases it is always central, in severe cases the greatest pathological changes are in the central region, and they progressively diminish in degree as the periphery is approached. This is due to the fact that the rays falling normally on the centre of the cornea are more concentrated that those falling slightly obliquely at the periphery, where the effect is therefore more spread out—the relation being comparable to the proportionate heat of the midday and evening sun. Further, some energy is always lost by reflection at the air-cornea surface, and the amount thus lost is a function of the angle of incidence, varying as its cosine (Lambert's law); the greater the angle of incidence—that is, the more obliquely the incident rays strike—the greater the loss by reflection, and the smaller the quantity absorbed. For these two reasons the intensity of absorbed energy per unit area diminishes progressively from the centre to the periphery, and the lesions are preferentially central.

### *Pathology.*

The pathological findings in a moderately marked lesion caused by ultra-violet light from a water-cooled mercury-vapour lamp as seen in the rabbit's eye are characteristic. There is a latent period usually of six to eight hours, which varies directly with the length and intensity of the exposure, during which no changes can be made out either macroscopically or microscopically. Thereafter in the slighter cases there is merely a stippling of the cornea with irregularity of its reflex and sometimes vesicular formation, accompanied by hyperæmia of the conjunctiva. After greater exposures the central corneal epithelium is desquamated and stains diffusely with fluorescin; still greater exposures leave a diffuse central interstitial haze, or a marked central opacity usually with sharply defined margins. The conjunctiva shows a considerable amount of inflammation with marked swelling and œdema, associated with a muco-purulent discharge. The changes are at their height in 48 hours, and thereafter gradually die down, the rate of recovery again varying directly with the intensity on the radiation. In three to five days after a moderately severe exposure the epithelium has reformed, and on clinical examination the eye appears normal. An opacity, if one has been formed, becomes highly vascularised in six to eight days, and tends to clear up to a surprising degree in four to six weeks, leaving a translucent interstitial haze.

A lesion due to the longer heat rays, on the other hand, is quite different. These were studied as produced by exposure to a bare carbon arc, the ultra-violet being screened off and the light at the same time being concentrated by a glass lens of 0·75 cm. thickness. This eliminates the greater part of the abiotic wave-lengths, and any pathological action is therefore a thermic effect. Here there is no latent period, discomfort is felt at once unless the cornea is cocainised, and both macroscopical and microscopical changes are induced immediately. There is no stippling of the cornea and no impairment of its surface or susceptibility to stain. In the whole of its thickness it looks sodden and cloudy, and an opacity forms almost immediately, while a conjunctivitis in much more marked degree than is the case under a corresponding abiotic radiation is very soon evident, accompanied by much chemosis and œdema and a frankly purulent discharge.

Histological examination also shows a typical picture. In the abiotic lesion, corresponding to the degree in which the rays are absorbed, the degree of pathological changes decrease in severity from without inwards through the thickness of the cornea, and gradually tails off towards the periphery. In the central region, 48 hours after moderate exposures, the surface epithelium is completely absent, and with it some of the more superficial corneal lamellæ have disappeared; more peripherally the outer epithelial layers only have exfoliated, leaving the basal cells spread out and spaced apart; further, towards the periphery the epithelium is normal. The lamellæ near the affected area are swollen and stain less readily with eosin, while the corpuscles show nuclear fragmentation and the cytoplasm becomes granular and eventually disappears, the entire cell disintegrating. There is massive eosinophile-celled infiltration—an appearance so evident as to be very striking. Descemet's membrane and the endothelium remain normal. Histological examination 10 to 15 days later shows no appreciable effects.

The conjunctiva shows histologically desquamation of the outer layers of the epithelial cells, while the basal cells are degenerated and spread out. There are small hæmorrhages, much congestion, and polymorphonuclear and plasma cell infiltration, and the subepithelial connective tissue shows hyaline degeneration. The secretion in the acute stage contains eosinophile cells.

The histological picture is quite different in a lesion due to the thermal action of visible and infra-red rays. The surface epithelium, cooled by contact with air, is intact, and, conversely to the abiotic reaction, the lesion increases in severity as the distance from the surface increases, the endothelium being completely destroyed in the central region. The corneal lamellæ are much swollen and have lost their structure in the central region, where the corpuscles are completely destroyed. The edges of the lesion are sharply defined, and are surrounded by an area of cell stimulation and proliferation, and in the periphery there is much leucocyte infiltration.

### *Clinical Symptoms.*

Photophthalmia, as it is met with clinically, is accompanied by a very characteristic symptomatology. There is always a latent period whose length varies with the intensity and duration of exposure; for ordinary exposures it lasts about six or eight to ten hours, and the unpleasant effects therefore usually start during the evening or night following. With extreme experimental intensities of exposures the latent period has been reduced to 30 minutes, and it

would seem never to have exceeded 24 hours—the factor of physiological repair apparently counteracting the abiotic effects of radiation of intensity so weak as to necessitate a longer latent period than this. The first symptom is a sensation of slight pricking as of a foreign body in the eye, which in the mildest degrees of the trouble is all that may develop. After moderately intense radiation, as in the usual doses accidentally received, this is followed by considerable disturbance rapidly increasing to pain, accompanied by extremely marked photophobia, profuse lacrymation occurring often in crises, and blepharospasm, while an hour or two later ciliary neuralgia often develops. Meantime the eye becomes red and injected, exceptionally chemosis develops, and the pupillary reflexes are often delayed, while on the surrounding area of the skin of the face there is invariably some degree of erythema. On the whole, however, the objective signs lag behind the subjective symptoms. In the acute stage the cornea shows irregularity of its reflex, and if stained with fluorescin will be found to be stippled or to assume a diffuse slight central haze. The most distressing symptom is the blepharospasm, which, coming on as it usually does in the middle of the night, reduces the patient, as the writer knows from personal experience, to a peculiarly miserable and impotent condition. It is essentially a reflex protective mechanism, the lids closing tightly and involuntarily over the damaged cornea denuded of its epithelium and with its nerve terminals exposed, just as do the abdominal muscles over an inflamed peritoneum. The least attempt at movement, or the incidence of light increases this reflex spasm and brings on an acute paroxysm of pain, and to remain still under these conditions is no easy matter. For the ordinary exposures received accidentally the acute symptoms last from six to eight hours, and most of the discomfort has disappeared in 48 hours; with more severe exposures they may last for some days. A certain amount of injection and photophobia usually persists for some time, and if there is already present a chronic infection in the conjunctival sac it may, by superadding itself, keep up inflammatory symptoms of greater or less severity. After severe exposures some headache and slight visual disturbances may persist for weeks.

An actual thermal lesion is rarely met with under corresponding conditions, since, owing to the immediate response of the tissues to this portion of the energy spectrum, the discomfort will not be tolerated, and the eyes and head are turned away and thus protected. It does, however, frequently occur in momentary exposures to sources of sufficiently high intensity. Thus a lightning flash, or the flash of the short-circuiting of a high-tension current, contains a large proportion of infra-red rays, and if near enough will readily produce a "power burn," which is very often a heat effect, although an abiotic reaction is frequently present also. Symptoms come on immediately without any latent period, and the signs of external inflammation are much more marked than in the case of an abiotic reaction. There is great injection, chemosis, and almost always a frankly purulent conjunctivitis; it lasts in great severity for several hours, but, apart from any gross tissue damage that has been caused, the symptoms clear up more quickly than in the case of a lesion due to short-waved light. In the short-circuit flash the permanent tissue damage that may occur comprises haziness of the cornea (Rivers, Terrien, Lundsgaard), and an actual burn of the conjunctiva, usually accompanied by a similar burn on the face (Rivers, Terrien, Desbrière, and Bargy). Similarly, Silex, Vossius, Rivers, Dunbar Roy, and Le Roux and Renaud have noted corneal injury after a lightning flash. The energy involved in both of these is more than sufficient to exceed the threshold we have already seen to be necessary to produce an effect; thus that emitted from a short circuit involving 100 kilowatts is of the intensity order of $30 \times 10^6$ erg-secs. per square centimetre at 0·5 metre distance, and according to the estimate of Lodge the energy involved in a lightning discharge may be $10^{20}$ ergs. That such cases occur only rarely clinically is due to the fact that the discharge does not often occur sufficiently nearly and yet leave the individual free from actual electric effects, which mask the milder photophthalmic symptoms by causing lesions of a very much graver nature or even death.

### *The Occurrence of Photophthalmia.*

The typical course of an acute attack of photophthalmia as described above refers principally to the effects of exposures to the mercury-vapour lamp or a naked arc as it occurs, usually accidentally, in the laboratory or the clinic, but, within limits, it may be taken to apply to all similar conditions where short waves constitute the greater part of the radiated energy. Such exposures are fairly frequently incurred both industrially or under natural conditions.

(*a*) *Industrial Photophthalmia.*—Arc lamps have frequently given rise to photophthalmia, especially when they are being tested photometrically. A similar occurrence is met with in those exposed to the flash of a short circuit or to the emanations from molten metal in electric welding. In cinema studios a large quantity of photographically active light is necessary, and this is usually made up of two types: "soft lighting," which is obtained from "banks" of mercury-vapour lamps, and "hard lighting," derived from arcs used in searchlights. In this country in 1920 these were used unscreened, and the actors and actresses exposed to them suffered from alarming photophthalmic symptoms. Although no obvious trouble occurs when these are screened by glass, as they are always now, it is to be remembered that such a screen, while cutting off rays under 3000 A.U., transmits those above this, and the 3020 line in the mercury arc spectrum is of considerable intensity. While at the working distance this is not in intensity sufficient to cause photophthalmia, it is not improbable that with exposures lasting intermittently for years some more insidious damage might be caused in the inner eye, as will be considered in the later articles of this series.

(*b*) *Photophthalmia under Natural Conditions; Solar Photophthalmia.*—Owing to the absorption of ozone in the outer atmosphere the lower limit of solar radiation reaching the earth is 2910 A.U. Although the atmosphere appears to be more permeable to the shorter waves in extreme cold and the amount of the shorter waves penetrating it varies considerably, the percentage of rays between 3050 and 2910 is comparatively small and probably averages only 0·25 per cent. of the total solar energy (Abbot). Ordinarily, therefore, the sun-light does not produce symptoms of photophthalmia; when, however, the direct light is reinforced by a dazzling reflection in sufficient intensity from a surface of great extensity as the sea, the desert, or a snow-field, and an exposure of several hours to this doubled source is experienced, the critical threshold of abiotic energy may well be exceeded and symptoms of photophthalmia develop. The commonest form met with is that experienced after exposure to bright sun-light on a snow-field—usually called "snow-blindness—a thoroughly unsatisfactory term, since the photophthalmic symptoms are not caused by the snow but by the solar energy partly reflected from the snow, neither is there any blindness apart from dazzling and occasionally amblyopia and a central colour scotoma which may incidentally accompany the typical photophthalmic symptoms. A large literature has accumulated on the subject of solar photophthalmia, and its effects on mountaineers and explorers are well known, while the Eskimos suffer from it to a considerable extent (Daland). Neither are animals exempt, the polar bear sometimes being a victim (Rossi). The trouble is usually a mild one, and comes on after exposures lasting several hours. The typical symptoms already described are experienced after the usual latent period. In those living in these regions perpetually a chronic form is often encountered.

Although ordinarily the abiotic radiation present in the energy spectrum of the sun does not exceed the liminal threshold for producing pathological effects on the outer eye, cases have been reported of individuals who appear to have been abnormally sensitive—as, for example, that of a woman (Syme) who got an erythematous eruption on the face and injection of the eyes on every particularly bright day in summer. Such a reaction appears akin to the action of a sensitiser, and may be due to the presence of some substance of this nature in the blood of these people; it is, however, rare (compare hydroa æstivale).

*Chronic Photophthalmia.*

A chronic form of photophthalmia was produced experimentally in rabbits by Birch-Hirschfeld, by exposing their eyes for ten minutes daily for 180 days to a mercury-vapour lamp. After the usual symptoms of acute photophthalmia had passed off the lesion which developed was a chronic mild conjunctivitis of the follicular type, the appearance of the conjunctiva, which was everted during the exposures, resembling very closely the typical picture of vernal catarrh.

Chronic photophthalmia of a somewhat similar nature is met with industrially (Behr) in welders and others who are frequently exposed to light sources emitting short-waved energy, and is usually accompanied by visual disturbances and an increased sensitiveness to light. The term usually applied to the condition—ophthalmia electrica chronica—is a misnomer, since electricity has nothing at all to do with the matter. The occurrence of solar photophthalmia in the chronic form has already been mentioned; it was first described as "keratitis solaris exfoliativa" by Kilkowe. Its occurrence is widespread wherever there is snow over a large part of the year; Gardner and Strader note it in America, Berlin and Enval in Scandinavia, Kilkowe and Gnonin in Central Europe, Reich in the Caucasus, Shorney in the Australian Alps, and Daland in Alaska, Siberia, and the Arctic Ocean. Infiltration and often ulceration of the cornea occur, resulting eventually in permanent impairment of the cornea with a band-shaped opacity running transversely, corresponding to the palpebral aperture as it is narrowed by approximation of the lids to avoid as much as possible the distressing glare from the snow. In all these places the natives have learned to protect themselves, some of the more primitive adopting correspondingly primitive devices; thus the Eskimos wear "glasses" made of a piece of wood or horn strapped round the head with a thong in which are cut two horizontal or vertical stenopœic slits opposite the eyes, through which the snow can be viewed with impunity, just in the same way as the sun is examined in eclipse with comfort through a pin-hole.

Owing to the similarity of the lesions produced experimentally by Birch-Hirschfeld to the appearance of the changes in the conjunctiva in vernal catarrh, the presence of eosinophile cells in both lesions, the fact that the incidence of this disease is limited largely to the hotter months of the year and the warmer countries, and its ready amelioration by bandaging the eyes, the hypothesis was advanced that it was a form of chronic photophthalmia due to short-waved light (Schiele, Kreibeich); and Junius suggests that its incidence may be determined by the presence of a sensitiser akin to hæmatoporphyrin in the blood. Vogt, on the other hand, suggested that the infra-red was the pathogenic factor. Although its ætiology has not yet been definitely cleared up, it is more than probably due to an infective agent; the resemblances mentioned are all superficial, and that it is certainly not due to ultra-violet light is seen in that it occurs almost exclusively underneath the upper lid, which cannot be reached by these rays in any circumstances, only very rarely on the lower lid, which might occasionally and with difficulty be reached, and almost never on the bulbar conjunctiva, to which these rays always have ready access.

*Treatment.*

The treatment of photophthalmia is properly prophylactic; it is in the great majority of cases an accident or the result of carelessness in omitting to wear protective glasses on all occasions where exposure to short-waved radiations is possible. The fact of the liminal energy threshold has already been noted, and very short exposures to the sources in common use are therefore harmless, but it is to be remembered that short exposures are additive within a period of 24 hours. Widmark first showed in 1889 that the clinical symptoms were prevented by a plate of ordinary glass 0·5 cm. thick, and for exposures of ordinary intensity and short duration a pair of ordinary spectacles affords sufficient protection. With severe or prolonged exposures, however, it is found that ordinary glass will allow the transmission of waves capable of producing a violent reaction. This substance may be taken to absorb rays shorter than 3000 A.U., but we have seen that abiotic activity is obtained in the cornea up to 3050, and the 3020 line in the mercury-vapour spectrum is well marked. Moreover, for those continually exposed, the distressing glare is peculiarly trying without a considerable screening effect. A very large number of proprietary glasses have from time to time been put on the market to meet the case, most of them as commercial propositions, few of them with anything particular to recommend them. For purposes where it is wished to screen off the ultra-violet alone, Crookes' A glass is the most efficient. Where it is desirable that the visibles should be partly cut off, as usually applies to those conducting a clinic, or to those exposed to the glare from snow, &c., Crookes' B gives the best results, although ordinary smoked glass gives almost as much protection. None of these cut off the infra-red, and where these are to be excluded Crookes' sage-green glass eliminates 95 per cent., while as cutting off both ends of the spectrum, and toning down the luminous region, Pfund's gold-plated glass (American Optical Co.) is very effective and still permits of good illumination. This is made up of a very thin layer of prepared gold placed between a lens of ordinary crown glass and one of Crookes' A. The crown glass merely serves to protect the gold; the layer of gold reflects 98 per cent. of the infra-red and allows up to 75 per cent. of the luminous waves to pass, and the Crookes' glass absorbs the ultra-violet.

When once the attack has developed little can be done to reduce the distressing severity of the symptoms. Bromide and aspirin control the neuralgia, the former being well taken prophylactically after an accidental exposure. Cocaine in oil, locally administered as drops, reduces the corneal discomfort, and bandaging (not shading) the eyes, preferably with cold compresses, reduces the blepharospasm, especially if resorted to from the very beginning. Usually, however, this does not by any means relieve it and the accompanying paroxysmal pain; in such cases the most effective measure is to immerse the head in cold water, a procedure which gives great, though only temporary, relief.

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# THE AFTER-EFFECTS OF DIPHTHERIA ON THE HEART.

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IT has been recognised for many years that diphtheria has a serious effect on the neuro-muscular mechanism of the heart in a certain percentage of cases, and fatty degeneration of the heart muscle was described by Bristow as long ago as 1859. Other early investigators were Trousseau and Bretonneau, who noted the symptoms of those patients with diphtheria dying from heart failure.

In a report based on the diphtheritic cases admitted to the Philadelphia Hospital for Contagious Diseases during the summer of 1920, S. C. Smith [1] found that in 72 per cent. there were no cardiac complications, though the majority had tachycardia on admission, but in 28 per cent. vagaries of the pulse developed after several days, and in a few of these patients grave heart trouble succeeded. The initial tachycardia might last 36–48 hours only, but tended to persist for several days if myocarditis were present, and might end in heart-block, which occurred suddenly on the seventh day. In 75 per cent. cases death took place in 36–48 hours. The block was usually complete, and its occurrence depended on the constitution of the patient, the length of time that had elapsed before antitoxin was given, the degree of toxicity of the disease, and the persistence of the tachycardia indicating the presence of myocarditis. Sinus arrhythmia was frequently found, and was considered by Smith to be physiological.

Premature beats occur in about 20 per cent. of the cardiac cases, more commonly arising in the auricles, and are of serious import if appearing in the first three weeks.[2] Auricular fibrillation is rare, though cases have been recorded by Parkinson [3] and Price [4] occurring in conjunction with heart-block. Death may occur early, about the tenth day, from acute myocarditis, or later, about the third week, from fatty degeneration of the heart muscle.[5]

In a paper by F. W. White [6] based on 78 cases of diphtheria with heart complications, studied after discharge from hospital, he stated that most of the cases had murmurs with more or less cardiac enlargement. Sixty-five cases recovered completely during observation, of whom the majority cleared up in 2–4 months; 20 still showed signs after four months, and of these six cleared up in the following three months. In 13 cases the signs were persistent. In most cases there were no symptoms of heart trouble, but some were short of breath on exertion. He found, however, that the heart was often affected in the absence of symptoms as shown by enlargement, accompanied in 31 patients by a systolic murmur at the mitral area and by an accentuation of the second sound at the pulmonary area. This was due in most cases to dilatation and relative mitral incompetence. The murmurs were mainly over the mitral area, and were frequently transmitted into the axilla, increased by exercise, and accompanied by an accentuated pulmonary second sound. In a few cases these signs persisted, indicating pathological changes in the mitral valve.

In some of the older children systolic murmurs were heard over the base, altering with respiration and change of position; these tended to disappear as the patient improved, and were regarded as hæmic. Pulse irregularity was frequently seen, and also tachycardia. In the severer cases, who had been kept in hospital 2–3 months, White found heart symptoms common, especially palpitation, weakness, pallor, and faintness after exertion, and occasionally cardiac distress in older children. The heart was dilated, mitral incompetence was present, the first sound at the apex was weak and sometimes reduplicated, the pulse was rapid and often irregular, and there was diminution of the cardiac reserve. The mild cases cleared up completely in the course of a few weeks, but the more severe took 5–6 months or more.

Other observers in the main agree with him, though Veronese [7] has found moderate hypertrophy only, and Baginsky [8] considers that chronic myocarditis or mitral regurgitation often persists for years without symptoms.

### *Clinical and Electrocardiographic Findings in 16 Cases.*

My paper is based on 16 cases of diphtheria, which were sent to me for clinical and electrocardiographic examination on their discharge from the North-Eastern and North-Western Fever Hospitals. All these cases had definite signs of heart involvement during their stay in hospital. Their ages varied from 3 to 19, the average age being just under 10 years. The length of stay in hospital averaged 86 days, the longest time being 140 days and the shortest 56. In none of the cases were cardiac abnormalities noticed during the first week of the disease, the earliest recorded being on the eighth day and the latest on the thirtieth. The mean time when the first signs were apparent was the eighteenth day.

The following were the principal abnormalities found whilst still in hospital:—

Tachycardia was present in all but one case.
Cardiac enlargement was found in three cases.
Alteration of the first sound at the apex was noted in seven cases, reduplication being present in four of them.
Reduplication of the second sound at the apex was found in two cases.
Premature beats were noted in two cases, and both occurred in the fourth week.

These cases were discharged from hospital under the normal procedure as convalescent. I found, however, that in none of them was the heart condition normal. The tachycardia had tended to persist, and in nine out of the 16 cases the rate was over 100, the highest being 148 and the lowest 86. The mean rate was 107. Sinus arrhythmia was present in five cases, and premature beats arising in the auricles in one case. In three there was definite enlargement, but in one of these in which a mitral regurgitant murmur was present there was a suspicious history of past rheumatic trouble.

The heart sounds were altered in certain of the cases. In five cases the first apical sound was short, and in three reduplicated. In five the second pulmonary sound was accentuated, and a gallop rhythm was found in two. A systolic murmur was present in 11 cases, mostly over the mitral area, usually faint, but tending to be increased by exertion. One case had developed paralysis of the right leg in the third week of the illness, and was still rather weak on that limb. Pallor was noted in two cases. In half the cases heart symptoms were complained of or found at the examination. These were mainly shortness of breath on slight exertion, undue fatigue, and faint feelings on moving about quickly. In all

(*Continued from previous page.*)

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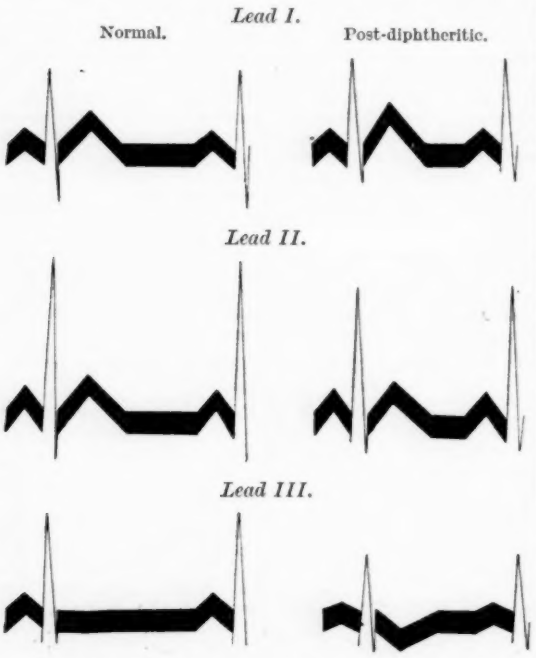
cases except one there was diminished cardiac reserve. This was more marked in those with tachycardia. I electrocardiographed every case, and also six children with normal hearts and of approximately the same ages in order to contrast the differences between the two series. The electrocardiographic differences between the post-diphtheritic cases and the "normals" are not of marked degree, the principal points of difference between them being the heart rate, 107 as against 84, and the increased negativity of the T wave in lead III. in the former. Other differences




occurring in lead III. are the diminished amplitude of the R wave, 5·1 mm. as against 9·2, and the P wave 0·78 mm. as against 1·5. There was also slurring of the Q.R.S. complex present in all leads in five of the post-diphtheritic cases, slurring of the R wave in lead I. in one case, and of the R wave in lead II. in another. I found, however, no damage to the conductive system beyond the slurring already referred to, which is probably due to involvement of the terminal arborisations of the bundle of His in the muscle-fibres themselves.

The following are the mean electrocardiographic measurements between the "normals" and post-diphtheritic cases.

*Normals.*

| Lead. | P. | P.R. | R. | S. | Q. | Q.S. | T. | S.T. | Cycle. |
|---|---|---|---|---|---|---|---|---|---|
| I. | 1·5 | 0·14 | 7·3 | 3·6 | 0 | 0·05 | 3·3 | 0·27 | 0·71 |
| II. | 2·2 | 0·14 | 13·5 | 2·6 | 0 | 0·05 | 3·4 | 0·27 | |
| III. | 1·5 | 0·14 | 9·2 | 1·1 | 1·1 | 0·05 | 0·13 inv. | 0·27 | |

*Post-diphtheritic Cases.*

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| I. | 1·5 | 0·14 | 8·2 | 1·2 | 0·6 | 0·048 | 3·9 | 0·25 | 0·56 |
| II. | 2·14 | 0·14 | 12·2 | 1·2 | 0·4 | 0·048 | 3·0 | 0·25 | |
| III. | 0·78 | 0·14 | 5·1 | 1·5 | 1·1 | 0·048 | 1·8 inv. | 0·25 | |

The vertical measurements are in millimetres, and the horizontal in seconds. The tension of the fibre of the electrocardiograph is standardised so that a current of 3 millivolts will cause a deflection of 30 millimetres on the scale.

*Summary.*

The 16 cases of my paper differ from normal children of the same age in the following respects: 1. The higher rate of the heart-beat. 2. The presence of cardiac symptoms in half the cases. 3. The diminished cardiac reserve. 4. The presence of heart abnormalities in almost all the cases. 5. The changes in the electrocardiogram, notably the presence of "slurring" of the Q.R.S. complex in five of the cases, and the alteration in the character of the third lead.

*Conclusions.*

From my investigation of these cases, though I am afraid the numbers are very few, I think it is a fair assumption to make that the effect of the diphtheritic toxin on the heart, in those cases where it has become involved during the course of the disease, is a more lasting one than is generally recognised. It is therefore, in my opinion, of the utmost importance that patients, in whom cardiac symptoms and abnormalities have been discovered during their stay in hospital, shall be thoroughly examined, both clinically and electrocardiographically, on their discharge before being allowed to return to their ordinary avocations, and that if the heart is found to be still affected they should be kept under observation until it has either regained the normal or has reached a stationary condition of recovery.

I should like to express my gratitude to Dr. F. H. Thomson, superintendent of the North-Eastern Fever Hospital, Tottenham, to Dr. E. W. Goodall, superintendent of the North-Western Fever Hospital, Hampstead, for their kindness in sending these cases to me, and to Dr. Ursula Blackwell, medical officer at the North-Eastern Fever Hospital, to whom I am indebted for the selection and hospital records of most of the cases.

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# THE NATURE OF THE DEPRESSOR SUBSTANCE OR SUBSTANCES IN TISSUE EXTRACTS.*

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AND
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THE history of the subject may be told very briefly. In 1900 Osborne and Vincent [1] showed that extracts of nervous tissues cause a fall in blood pressure which is obtained after section of both vagi and after full doses of atropine. On the same date there appeared a communication by Halliburton [2] in which similar results were announced, with the important difference that neither nervous tissue extracts nor choline gave a fall after atropine. According to Osborne and Vincent, then, choline could not be entirely responsible for the depressor effect.†

In 1903 it was shown by Vincent and Sheen [3] that the depressor effect is not peculiar to extracts of nervous tissues, but is common to all the tissues of the body with the exception of the adrenal and the infundibular part of the pituitary. They found that, just as in the case of nervous tissues, extracts of other organs must contain some active principle which is not choline. The general statement that all animal tissues impart to watery or saline extracts a substance or substances which, when injected into the circulation

* The expenses involved in this research have been defrayed by a grant to one of us (S. V.) from the Government Grant Committee of the Royal Society.

† Schäfer and Moore [4] had incidentally noted a fall of blood pressure as the result of injection of brain extracts, and Mott and Halliburton [5] had suggested that the active substance was choline.

of a living animal, lower the arterial blood pressure was made in the first edition of "Internal Secretion and the Ductless Glands" published in 1912. About this time, too, the suggestion arose that the active substance might be histamine.

That these facts were well known has not hindered numerous sporadic communications to the effect that some tissue or other contains an active principle which lowers the blood pressure. It is necessary only to mention a few examples. In 1918 Marfori found that lymphatic glands contain a depressor principle, and quite recently McDonald,[4] and James, Laughton, and Macallum [5] have reported that there is a depressor substance in extracts of liver.

Attempts to isolate the active principle have not been very numerous. Vincent and Cramer [6] found that there are two groups of substances in watery extracts of nervous tissues, both of which, when injected into the veins of an animal, lower the blood pressure. Both are soluble in water and in saline, while one group only is soluble in alcohol. The alcoholic solution contains two depressor substances; one of them has its effect abolished by atropine, the other has not. Evidence was found of the presence of choline in the form of a di-choline anhydride, but it was abundantly clear that the depressor effect of nervous tissue extracts is not due entirely, nor even largely, to the presence of this choline derivative.

Owing to the appearance of numerous pharmacological papers on the action of histamine, the claim of this substance to be considered as responsible for the depressor effect has been more or less revived, but its position has always been weak, because it is insoluble in ether, while the depressor substance (or substances) is soluble in this medium.

A not unnatural suggestion—namely, that the lowering of blood pressure is due to a mixture of choline and histamine in the extracts—has quite recently been made by Best, Dale, Dudley and Thorpe.[7] On referring to the papers of Osborne and Vincent and Vincent and Sheen, it will be seen that tracings are shown in which the depressor effect of tissue extracts is clearly indicated before and after atropine in all three laboratory animals—dogs, cats, and rabbits. These, as recently pointed out to us by Prof. R. J. S. McDowall, show clearly that histamine cannot be concerned in the effect as this substance does not produce a depressor effect in rabbits, except under special conditions which need not be referred to here.

We have repeated and extended the experiments upon rabbits and find that, before the administration of atropine, choline produces a fall; histamine, either no effect or a rise; a mixture of choline and histamine, a very slight fall usually combined with a slight rise; tissue extracts a pronounced fall. After atropine choline produces a marked rise; histamine either no effect or a rise; a mixture of choline and histamine a slight but pure rise; tissue extracts a pronounced fall. Thus we have abundant evidence that, although choline and histamine may be present in tissue extracts, and may be partly responsible for their physiological activity, there must also be present some other substance which differs fundamentally in its pharmaco-dynamical action and presumably, therefore, in its chemical nature, from either of these substances.

There is some evidence that choline plays a larger part in the actions of nervous tissue extracts than in those of extracts of other organs and tissues, though even in the former it is clear that a large part of the effect is due to some substance which is neither histamine nor choline.

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# Medical Societies.

## ROYAL SOCIETY OF MEDICINE.

### SECTION OF LARYNGOLOGY.

THE summer meeting of this Section took place on June 3rd and 4th, under the Presidency of Dr. W. H. KELSON, the first session being devoted to the reading and discussion of papers.

Sir WILLIAM WILLCOX read a paper on

*Nasal Sinusitis as a Cause of Toxæmia.*

His object was to show how frequent was the rôle played by nasal sinus disease in conditions of illness, the causation of which was obscure, looking at the subject from the standpoint of the general physician. He maintained that in most cases, if one was alive to the possibility, some focus of infection could be found. Sometimes X rays showed a shadow when transillumination did not reveal any striking differences, and in this connexion he said he thought the radiologist should restrict himself to stating what he found, leaving the interpretation to others. For instance, to report that there were certain abnormal dark areas was within the radiologist's province, but the declaration that pus was present might launch the physician into a sea of uncertainty. Sir William Willcox emphasised the importance of sinus examination in all cases of chronic ill-health. Each patient presented a problem in immunity, and the management of every case should be based on that view, and operative measures should be restricted as much as was consistent with the best interests of the patient, who should be given every chance to recover from the auto-intoxication. He showed several patients and recounted their histories, which definitely supported his contentions.

Sir STCLAIR THOMSON said transillumination was of value only in comparing one side with the other. The only certainty in the matter of diagnosis was afforded by exploration, and he was glad Sir William Willcox had put forward the plea that the radiologist should cease from diagnosing sinus trouble, not only because he had not the evidence to enable him to do so, but his declaration sometimes placed the physician in an awkward position with his patient, who knew the opinion which had been given. Sir StClair Thomson showed charts of cases in support of Sir William Willcox's paper.

Mr. HERBERT TILLEY agreed that if an antrum was dark on transillumination it did not necessarily mean it was the seat of active disease.

Dr. P. WATSON-WILLIAMS agreed with the advice to seek for a focus of infection in cases of obscure illness, and not to wait until there was clear evidence of infection. Pancreatic disease was sometimes due to a chronic infective condition, often associated with chronic cholecystitis.

Dr. W. SYME said there had long been a tendency to deal too leniently with suppuration in the accessory sinuses, both in regard to diagnosis and treatment. Transillumination might lead to error in many cases of antral disease; the only method was to examine the contents of the antral cavity derived by puncturing it.

Sir JAMES DUNDAS-GRANT spoke of osteo-arthritis which probably originated in sinus disease, and said he had seen nervous and despondent people restored to health and cheerfulness after the ethmoid cells had been cleaned out. He advocated a greater use of transillumination by the general practitioner.

Dr. A. LOGAN TURNER read a joint paper, by himself and Dr. F. E. REYNOLDS, on

*A Fatal Case of Leptomeningitis.*

This was a case in which the death of the patient followed an operation on the ethmoidal air cells, and Dr. Turner showed, by means of an admirable series of slides from the case, the path which the infection

took. He submitted the contribution because the case clearly showed that one possible path of infection between the nose and the intracranial structures was via the lymphatic channel. The patient, a man aged 33, had suffered from nasal obstruction due to polypi on both sides. These were removed and the ethmoidal cells exenterated. Following this, a temperature of 103·8° F. quickly developed and pneumococcus was grown from the turbid cerebro-spinal fluid. Death took place five days after the operation.

Dr. W. JOBSON HORNE gave a short contribution, supported by an epidiascopic demonstration, on the

*Rôle of the Lymphatics in Laryngeal Disease.*

Twenty-five years ago, he said, it occurred to him that the lymphatic supply of the larynx was an open field for research, and since then, as the material arrived, he had been following the subject up. First he dealt with cases in which there was established disease in the larynx, and the lymphatics became involved subsequently. It was strange that there were very few diseases of the larynx in which the adjacent and corresponding cervical glands became implicated. One notable exception to this was malignant disease of the larynx. In this, sooner or later, the glands became involved, and the period at which that occurred depended largely on whether the cancer was extrinsic or intrinsic. In the case of the latter, the date of gland involvement depended on whether the part of the larynx attacked was covered by squamous epithelium or by columnar epithelium, it being earlier in the latter than in the former, and the results of interference in these cases was less satisfactory. As to the rôle of the larynx in lymphatic disease, he showed sections from cases of Hodgkin's disease and of mediastinal sarcoma in which the larynx became involved. He said that some sarcomata seemed to be remarkably benign, and some authorities considered that they should be classified with the granulomata. He did not claim that the condition of the larynx was responsible for Hodgkin's disease, but it was one site of infection, and the particular vulnerable site was between the cartilages of Santorini and Wrisberg.

The second session was devoted to clinical cases. In the evening the Section entertained Sir StClair Thomson, the President of the Society and a prominent member of the Section, to dinner.

## EDINBURGH OBSTETRICAL SOCIETY.

AT a meeting of this Society held on May 12th Dr. R. W. JOHNSTONE, the President, being in the chair, Dr. F. J. BROWNE described a case of

*Concealed Hæmorrhage with Placenta Prævia.*

The patient, he said, was a primigravida who had completed eight months of her pregnancy and was admitted to hospital on account of vaginal bleeding. Placenta prævia was diagnosed and the vagina was packed. Twelve hours later the pack was removed and external version attempted, but was not persevered with on account of the large amount of old blood-clot that was passed. The membranes were therefore ruptured and spontaneous delivery took place three hours later. The placenta was normal in appearance and size, but overlying it was a quantity of fairly old blood-clot, which covered practically the entire portion which had been prævia and extended into the upper portion as well. The clot weighed over 12 oz. A catheter specimen of urine contained a moderate quantity of albumin. Three other cases described by Holland, Williamson, and Swayne were discussed, after which Dr. Browne stated that none were cases of purely unavoidable hæmorrhage, and his own case showed that in some cases of placenta prævia the hæmorrhage might be concealed; the concealed hæmorrhage, however, might be due to mechanical separation of the portion of the placenta situated in the lower uterine segment and in this event would be unavoidable. Placenta prævia could not be excluded in a case of concealed hæmorrhage, and some cases of concealed hæmorrhage without albuminuria might be accounted for in that way. In all cases described, however, albuminuria was present and, therefore, it was justifiable to presume the bleeding to be of toxæmic origin; thus bleeding in placenta prævia might sometimes be accidental.

Dr. W. F. THEODORE HAULTAIN spoke on

*Some Practical Aspects of Antenatal Care,*

the great importance of such care to mother, child, doctor, and the State being pointed out. Dr. Haultain disagreed with the relative frequency of the vertex positions as stated in the leading text-books on the subject. From statistics of 1000 cases seen within 14 days of labour at the antenatal clinic of the Simpson Memorial and Royal Maternity Hospital, Edinburgh, and another 1000 uncomplicated full-term cases delivered in the labour ward of the same hospital, the relative frequency in round figures was found to be L.O.A. 60 per cent., R.O.A. 30 per cent., R.O.P. 8 per cent., L.O.P. 2 per cent. The figures for primiparæ and multiparæ were taken separately in each case, but little variation was shown in these two main groups.

*Relative Frequency of Vertex Positions.*

| — | Primiparæ cases. | | Multiparæ cases. | | Total cases. | |
|---|---|---|---|---|---|---|
| | Antenatal, 452. | At labour, 477. | Antenatal, 548. | At labour, 523. | Antenatal, 1000. | At labour, 1000. |
| | % | % | % | % | % | % |
| L.O.A. | 56·4 | 63·7 | 55·5 | 66·9 | 55·9 | 65·4 |
| R.O.A. | 32·3 | 27·0 | 34·5 | 25·3 | 33·4 | 26·1 |
| R.O.P. | 8·9 | 8·4 | 7·1 | 5·9 | 7·5 | 7·1 |
| L.O.P. | 3·3 | 0·9 | 3·1 | 1·9 | 3·2 | 1·4 |

The efficacy of pads as described by Buist in posterior cases was then discussed, and statistics were given of 70 consecutive occipito-posterior cases which had been treated at the antenatal clinic during the last two years; 38 of these were primigravidæ, and in these the pads proved successful in 33 by substituting an anterior position for the posterior; in multiparæ 25 were successful, thus in the whole 70 cases success was obtained in 82·8 per cent. In every case success or failure was judged by the position at labour as well as that found in the clinic after removal of the pads. To achieve success it was stated that (1) the treatment should not be done till the last month of pregnancy, (2) the head must be movable, and (3) castor oil should be taken at night when the pads were in position. No danger could be caused by the treatment to either mother or child, and the difficulty of the future labour could not be aggravated by the treatment, which was very simple and would in many cases avoid a tedious and often dangerous labour.

The statistics of a consecutive series of cases of external version in breech presentations was then given. In all 28 cases had been so treated in the last one and a half years, 12 in primiparæ and 16 in multiparæ. Among the primiparæ version was successful on nine occasions and among the multiparæ 14 successes were reported; thus 82 per cent. of the total number were successful. Anæsthesia was recommended to aid success in primigravidæ and the manipulation was not advised till the last month of pregnancy. Failure in the primigravidæ was attributed to the cases being of the "frank breech" variety, the failure in each case being noted at the time of manipulation, whereas in the multiparæ the two failures were caused by a return of the breech presentation after it had been turned. The technique for the measurement of the diagonal conjugate was described; this measurement should not be taken more than six weeks before full term, for by that time the perineum and soft parts were soft and the promontory of the sacrum could be reached in most cases with comparative ease, whereas earlier in pregnancy it was usually a very difficult procedure. By the estimation at this period there

would be still plenty of time to decide on induction of premature labour if required, and if the pelvis was too small to warrant induction at that time then the case was one for Cæsarean section and not induction. With regard to the position of the patient to allow this measurement to be taken with the greatest ease, Dr. Haultain advised the exaggerated left lateral position, the woman flexing herself as much as possible. Extreme gentleness in making the estimation was necessary to obtain satisfactory results.

In conclusion, Dr. Haultain thought that antenatal care did not begin early enough, and suggested that patients should be seen after having missed one period; by that means a large number of abortions might be averted, especially those due to a retro-displacement of the uterus; the bowels could be looked after, and all cases of slight sickness could be treated; thus might hyperemesis gravidarum be practically obliterated. Rarer conditions such as tubal gestation could also be recognised before rupture occurred and the woman's life put in danger.

## ROYAL ACADEMY OF MEDICINE IN IRELAND.

### SECTION OF MEDICINE.

A MEETING of this Section was held on May 14th, Dr. F. C. PURSER, the President, being in the chair.

Dr. R. STUMPF read a paper on

*Rontgen-Therapy in Connexion with Certain Blood Diseases.*

Having reviewed the treatment of polycythæmia rubra vera, pernicious anæmia, and lymphatic leukæmia, he considered the subject of myelogenous leukæmia in greater detail. In his opinion, the best treatment was by X rays combined with the administration of arsenic. There was never complete cure, but cases were known in which improvement sustained over many years had resulted from X ray treatment of this condition. Relapses occurred in weeks or months, each responding, but ever more slowly, to treatment. After each treatment there was a diminution in the size of the spleen, a drop in the leucocyte count, and an improvement in the patient's general condition. The focus for radiation was the spleen. The essential point to remember was that each case must be treated on its individual merits and no dogmatic scheme could be followed. The aim was to improve the patient's general health rather than to attain a rapid diminution in the size of the spleen and an immediate drop in the number of leucocytes. As regards technique, it was best to start with small doses and increase them very carefully. Dr. Stumpf gave an acount of a case of myelogenous leukæmia. Mrs. B., aged 23, showed for several months atypical symptoms and suddenly developed a severe pain in her abdomen about a year ago. The spleen was found to be much enlarged and the leucocyte count was 250,000 per c.mm. She had had three courses of X ray treatment, and during part of the time was getting injections of arsenic. In the course of treatment the leucocytes gradually fell from 250,000 to 25,000 per c.mm. This favourable figure had not been maintained, since it was not considered necessary to give sufficient exposures to the X rays to bring about this result, the patient's general health being excellent. Frequent blood counts were being carried out and sufficient treatment was given to maintain the leucocytes somewhere between 60,000 and 90,000 per c.mm. At the beginning of treatment the spleen reached to below the level of the umbilicus and extended across the middle line. It was now three fingers-breadth below the costal margin and was well to the left of the middle line. The patient's weight had increased very considerably and her general condition was excellent.

Dr. A. R. PARSONS said that his results had been much the same as Dr. Stumpf's as regards early improvement and subsequent failure to repeat the first success. He asked whether deep X ray therapy had any advantage over ordinary X rays.

Dr. MAURICE HAYES said that with deep X rays the number of treatments were less, the intervals between treatments were longer, and the risk of damaging the skin less; also by deep X rays it was possible to get a more uniform radiation at the first dose.

Dr. J. SPEARES wondered if X ray treatment did in reality prolong the life of these cases. As to lymphatic leukæmia, it was his experience that the patient might live a very long time. He was at present treating a patient who had had the disease for 21 years.

Sir JOHN MOORE read a Historical Note on Alkaptonuria, recalling the first example of this abnormality described in Dublin, at a meeting over which the speaker presided 45 years ago.

*Exhibition of Radiograms.*

Dr. J. SPEARES and Dr. G. BEWLEY showed radiograms of three cases of diaphragmatic hernia. One of Dr. Speares's cases had marked gastric symptoms for relief of which operation was urged. Dr. Bewley's case was one of eventration.

Dr. C. L. MCDONOGH showed radiograms of (*a*) rickets with multiple fractures; (*b*) sarcoma of the sternum. In the former case eight fractures of long bones were to be seen, the changes typical for rickets being marked in the long bones, ribs, and skull. In the latter case the X ray appearance of the tumour, the failure to find any primary growth, and the negative W.R. pointed to the very rare condition of primary osteo-sarcoma of the sternum.

Dr. T. GARRETT HARDMAN and Dr. LEONARD ABRAHAMSON showed radiograms of a chest after injection of lipiodol, and gave an account of the technique employed.

### SECTION OF ANATOMY AND PHYSIOLOGY.

A MEETING of this Section was held on April 16th, Dr. C. M. WEST, the President, being in the chair.

Prof. J. M. O'CONNOR demonstrated Indian ink injections of the living kidney blood-vessels, and read a paper on

*The Blood Flow through the Kidney and its Relation to the Theory of Urine Formation.*

He said that by diverting the blood of the left kidney down the vena cava into a reservoir while the blood pressure is maintained by a reserve of blood in a compensation tube connected with the aorta, the blood flow through the kidney at constant arterial pressure could be examined. On closing off the compensation tube the flow with falling pressure could be determined. If the blood flow were graphed against the prevailing pressures there was, with falling pressures, a kink (or kinks) in the graph in the sense of increases or decreases in the blood flow. These kinks occurred at various levels of blood pressure and of blood flow, and were relatively the same at all levels in any one animal. A similar kink could be produced by diminishing the pressure in the renal artery by a clamp on the abdominal aorta, while the pressure was maintained constant in the rest of the body by having a carotid artery connected with the compensation tube. Similar alterations in flow either positive or negative resulted from the injection of diuretics. These results were in keeping with the suggestion that the flow of blood through the kidney is regulated by a compression of the glomeruli by the secretion pressure of the urine. Experiments in which the kidney vessels were injected with Indian ink showed agreement with the theory that the relative number of glomeruli uninjected or but partly injected corresponded with the kink on the graph of blood pressure and blood flow.

The PRESIDENT said that until he had heard Prof. O'Connor's paper he had not been aware of any opening of the glomeruli, and he did not see why even when destruction of the capsule occurred, it

should block up the vessels of the glomeruli. Referring to the injection and non-injection of glomeruli, he asked if Prof. O'Connor allowed the injection to flow for any length of time first, and to go on flowing till the kidney got black; or if the injection just flowed through the kidney vein. He himself did not see why the blood should flow through every vessel of the kidney at the same time.

Dr. W. A. TAYLOR asked if Prof. O'Connor had ever tried experiments to determine the amount of blood flow through the kidney in a given time, and had tried to determine from this the relation between the time of the blood flow and the amount of the blood flow through the kidney. He believed the blood flow through the kidney was very great.

Dr. F. H. MOORE asked if Prof. O'Connor had found the urine altered in any way after he had carried out his experiments; if, for example, when the vessels were clamped and the blood flow altered, there was any albumin in the urine. He mentioned the work of Oscar Clotts, of Montreal, in relation to the altered circulation of the blood in a nephritic kidney to that in an ordinary kidney. Oscar Clotts said that in nephritis one was dealing with an organ altogether different from a healthy kidney. He himself believed that rabbits suffered from chronic interstitial nephritis in their old age, and he wondered if the study of these animals would throw any additional light on Prof. O'Connor's theory, especially in relation to nephritis.

Dr. L. G. GUNN asked if, when Prof. O'Connor was experimenting on one kidney, the second kidney was left alone. Sometimes the secretion of one kidney stopped altogether for a time, but then the other kidney acted very vigorously. After nephrectomy it was quite common for patients to get attacks of polyuria without any apparent reason.

Prof. O'CONNOR, in reply, said that the kidney was almost stony hard, and this hardness varied accordingly to the activity of the kidney. If the kidney was secreting well it was especially hard. When an injection was given it always came out through the renal vein. The blood flow through the kidney was enormous. The maximum flow in a rabbit's kidney was 6 c.cm. of blood per minute. Cutting the kidney nerves caused vaso-constriction which gradually passed off; but sometimes the constriction was so great that no urine flowed for a considerable time. The second kidney was practically always left alone. It was commonly thought that the more urine was passed the better the kidney was working, but from his experiments he did not think it was so. He believed that as often as not, when the flow was small, the kidney was doing just as much work as when the flow was big.

# GENERAL MEDICAL COUNCIL.

## TUESDAY, JUNE 1ST.

### PENAL CASES.

IN accordance with the usual custom the penal cases were heard in public, the Council deliberated on them in camera, and the results were then announced.

The Registrar read a report by the Dental Board of the United Kingdom on *the case of William Birkett*, registered on June 21st, 1922, as of 189, East India Dock-road, Poplar, London, E. 14, who had appeared before the Board in November last, charged with employing an agent to canvass for him; also for certifying to the Royal Liver Friendly Society the delivery of certain dentures and receiving fee for the same when, in fact, no dentures had been supplied to the patient. The Board found certain facts satisfactorily established and considered that Mr. Birkett's name ought to be erased from the Register. The Council directed that it be erased.

*The Case of John Edward Rees* (adjourned from May, 1925).—This practitioner, registered as of 10, Priory-street, Carmarthen, L.R.C.P. Edin., 1913, L.R.C.S. Edin., 1913, L.R.F.P.S. Glasg., 1913, had been convicted of drunkenness on five separate occasions, three times when in charge of a motor vehicle, and judgment had been postponed for one year. Mr. Rees appeared, accompanied by his counsel, Mr. Daniel Johns, instructed by Mr. J. C. Williams, solicitor, of Carmarthen. Counsel read several letters in regard to Mr. Rees's good character since the previous hearing. The Council decided not to erase his name from the Register.

*The Case of Henry James Burke, M.C.*, registered as of Ivy House, Hadfield, Derbyshire, L., L.M., 1913, R.C.P. Irel., L., L.M., 1913, R.C.S. Irel. This practitioner had appeared before the Council in May, 1925, having been convicted at the Glossop police-court and Mottram Petty Sessions on three occasions of being drunk in charge of a motor-car. Judgment had been postponed for 12 months. Mr. Burke appeared in answer to his notice and gave an assurance that he would abstain from alcohol. Having considered evidence with regard to his conduct during the last 12 months the Council decided not to erase his name from the Register.

*The Case of Austin Heron*, registered as of West African Medical Service, L., L.M., 1924, R.C.P. Irel., L., L.M., 1924, R.C.S. Irel., had also been adjourned from the session of May, 1925. He was then charged with having been convicted, under the name of William Gallagher, at the Sutton Petty Sessions of insulting behaviour to certain females. Mr. Heron wrote from West Africa asking for the postponement of the Council's decision for another year, when he would be able to attend in person. The Council agreed to the further postponement.

## WEDNESDAY, JUNE 2ND.

*The Case of Andrew George Tottenham Hanks*, registered as of 10, Edith-grove, Chelsea, London, S.W. 10, L., L.M., 1888, R.C.P. Irel., L., L.M., 1888, R.C.S. Irel., who appeared before the Council in November last, having been convicted in London police-courts on four occasions of being drunk and incapable. Mr. Hanks was accompanied by his solicitor, Mr. Oswald Hempson, who handed in letters in regard to his good conduct in the interval. The Council decided not to erase his name from the Register.

*The Case of Abdallah Jacob Dowek*, registered as of 265, High-street, Pendleton, Salford, Lancs, L.M.S.S.A. Lond., 1925, who had been summoned to appear before the Council on the charge of seeking to promote his own professional advantage by inviting patients of Dr. Arthur Clouston Russell, whose assistant he had previously been, to become patients of his. The complainants were the London and Counties Medical Protection Society. Dr. Dowek attended, accompanied by Mr. Jackson, K.C., instructed by Messrs. Barrow-Sicree, solicitors. The complainants were represented by Mr. Dickens, K.C., instructed by Messrs. Le Brasseur and Oakley, solicitors. Dr. H. B. Brackenbury, a member of the London and Counties Medical Protection Society, took no part in the proceedings. Mr. Dickens examined Dr. Russell, who testified that while he was in hospital during the summer and autumn of 1925 his wife had engaged Dr. Dowek as his assistant. Dr. Dowek, when Dr. Russell came out of hospital and requested him to sign the usual bond, had refused to do so unless it contained conditions of his own providing for increased pay and his engagement as permanent assistant with a view to partnership. Dr. Russell, after giving Dr. Dowek two days to reconsider his refusal, had dismissed him with no further notice. Dr. Russell had then heard rumours that Dr. Dowek had set up in practice near by and had been trying to attract certain of Dr. Russell's patients to himself; he had therefore instructed one Chapman, whom he employed as his collector, to find out further details. As a result of the information Chapman gave him he had complained to his defence society. A statutory declaration

by Chapman was before the court, in which statement he admitted having misled Dr. Russell. Mr. Dickens called various patients of Dr. Russell's in evidence, some of whom testified that Dr. Dowek had called on them, inquired how they were and had told them that he was now in practice on his own. At the conclusion of the case for the complainants Mr. Jackson submitted that on the evidence before the Council there was no case for the accused practitioner to answer. The Council, after deliberation, dismissed the case.

*The Case of William Joseph Ryan.*—This practitioner's name was erased on charges of drunkenness, but leave was given to apply after an interval for restitution.

WEDNESDAY, THURSDAY, AND FRIDAY, JUNE 2ND, 3RD, AND 4TH.

*The Case of Samuel Grahame Connor*, registered as of 119, Oxford-street, London, W. 1, M.B., C.M., 1889, U. Edin. Dr. Connor appeared before the Council on the following three counts: (1) of affording to certain drug addicts facilities for obtaining dangerous drugs in the form of prescriptions, by which they were enabled to obtain from chemists morphine and heroin, such prescriptions not having been given in the ordinary course of bona-fide medical practice and treatment; (2) of supplying morphine, which he had obtained for his own surgery use, to certain addicts otherwise than in the course of bona-fide medical practice and treatment; and (3) of having been convicted at Marlborough-street police-court on March 29th, 1926, on each of three summonses for an offence against No. 9 of the Regulations made under the Dangerous Drugs Act, 1920—viz., of failing to enter in a register, kept for the sole purpose, 50 gr. of morphine purchased and obtained by him—and having been sentenced to two months' imprisonment in the second division for each of the three offences, and also fined £50 for each. Also of having been convicted at the same time of an offence against No. 5 of the said Regulations—viz., of giving a prescription for the supply of morphine and failing in that prescription to specify the address of the person for whom it was given—and having been fined £50. On appeal to the County of London Sessions the sentences of imprisonment were remitted and the fines ordered to stand.

The complainants were the Home Office, who were represented by Sir Travers Humphreys; counsel instructed by the Director of Public Prosecutions. Dr. Connor was accompanied by Mr. J. A. Hawke, K.C., M.P., and Mr. H. D. Roome, instructed by Messrs. Engall and Crane, solicitors.

Sir Travers Humphreys, in opening the case for the prosecution, submitted a principle governing the correct use of dangerous drugs. He suggested that their use was only admissible in certain circumstances. One was in attempting to cure an illness, another was in attempting to cure an addiction by administering diminishing doses, and the third was their use in minimum quantities to enable incurable addicts to live useful lives. If a medical man became a mere purveyor of drugs to anyone who asked for them he was abusing the great trust reposed in him by the State. In any case the essence of the proper use of dangerous drugs was strict personal supervision. The case against Dr. Connor, he said, was as follows: On May 28th, 1923, Dr. Crosse, a Divisional Medical Officer of the Ministry of Health, was sent to interview Dr. Connor about certain drug addicts. Dr. Connor had then told him that to give the drugs they required was the only way to get rid of some addicts who made a great deal of trouble. Dr. Crosse disagreed, and pointed out the necessity for refraining from giving dangerous drugs except to persons who could be strictly supervised. Dr. Connor agreed and thanked Dr. Crosse, confirming his agreement with these views almost immediately in a letter. Counsel now read a list of prescriptions given by Dr. Connor to a Mrs. V. D. down to the time of the interview with Dr. Crosse, in which he prescribed about 40 gr. at a time. The day after this visit Dr. Connor prescribed 10 gr., and thereafter progressively reduced the doses until March, 1924, when they again began to increase. By September, when she ceased to be a patient, she was getting 40 gr. a month. Miss P., another patient, had landed, said counsel, at Oban on June 17th, evidently ill, and had sent Dr. Connor a telegram containing the words "Please send, very important." The Home Office had sent Dr. Crosse to Dr. Connor with a copy of this telegram, which had been intercepted, and Dr. Connor gave him some particulars of the patient's history. She was then said to have been Dr. Connor's patient for about four years, and he told Dr. Crosse that she had been in a nursing home for phthisis and had first been given heroin by another doctor. The prescriptions registered by the chemist showed that this lady had received several amounts of four or five grains, sometimes on two consecutive days; he had continued to treat her after this and had prescribed steadily increasing amounts of heroin. Following an interview by an inspector of police in December, Dr. Connor had reduced these amounts, and in February Miss P. answered an advertisement of a lady doctor, Dr. Vivian, inviting resident cases. She was anxious to be cured if possible. Dr. Vivian had reduced her doses from a grain and a quarter a day to a tenth of a grain, and would say that she could have cured the patient if she had stayed long enough. However, after about five weeks a friend took her away. Dr. Vivian had found that Miss P.'s condition did not justify her receiving heroin.

Miss B., another addict, had been receiving very small doses of morphine and atropine from her regular medical attendant and had been introduced to Dr. Connor for the sole purpose of obtaining morphine. Whereas she had been getting only 92 gr. a year, Dr. Connor had given her 14½ gr. on the first day and in ten months had supplied her with 700 gr. On March 29th, 1926, two local practitioners, Dr. Dillon Kelly and Dr. Moon, had been called in to Miss B. for severe asthma and had decided that she was assuming the symptoms in order to get morphine. Dr. Moon had put her in Lambeth Hospital, where Dr. A. L. Baly had attended her. Dr. Baly had seen no reason to give her morphine and, with the exception of a quarter of a grain on the night of her admission, had given her no more up to the present. It was for omitting the address on one of Miss B.'s prescriptions that Dr. Connor had been fined.

Colonel S. G. had crashed during the war and injured his spine. Dr. Connor had been supplying him with enormous amounts of morphine; 100, and once 200, gr. at a time, either by prescription or in bottle. Finding it difficult to get morphine in Paris, where he lived, he paid periodical visits to Dr. Connor to obtain his supplies.

Miss Y., over whom the magistrate had sentenced Dr. Connor to imprisonment, was an old and quite incurable morphine addict. She had lived for years in Glasgow. On May 24th, 1924, a police officer visited Dr. Connor and told him that Miss Y. had been convicted of forging prescriptions to get morphine and was being attended by a doctor in Glasgow, who was prescribing this drug. In 1925 Dr. Connor had been writing orders to a chemist for quantities of morphine for surgery use, 50 gr. at a time, and posting the bottles off himself to Miss Y., the result being that in no chemist's register was there any indication that she was getting any morphine at all. In December, 1925, Dr. Connor told Inspector Burnby that Miss Y. had been to see him about six times that year and that he had sent other prescriptions to her in Glasgow. From the list of prescriptions it appeared that she had only come four times and that Dr. Connor had been supplying her by other means. She had had 850 gr. in 1925. When the officer asked for Dr. Connor's accounts and methods of requesting payment, Dr. Connor replied that he never rendered accounts and that his patients paid exactly what they chose. He said that on Dec. 11th the lady had sent him a money order for £8, for eight visits at about a guinea a time.

Of Dr. Connor's three convictions one was for failing to register quantities and names of recipients, and 850 gr. of morphine were unaccounted for. In his cross-examination at the quarter sessions Dr. Connor had said that he got the chemist to send to Miss Y. the morphine which he had ordered for surgery use in order to save her chemist's fees. Counsel submitted that this was no explanation. Further, Dr. Connor had admitted both that he knew that Miss Y. was being attended by a doctor in Glasgow and that she had been convicted for forging prescriptions.

Counsel then called Dr. R. E. Crosse, Divisional Police Surgeon, and examined him as a witness. Dr. Crosse said that he had called on Dr. Connor on May 28th, 1923, with a list of names of persons alleged to be addicts. Dr. Connor had said that, as he did not dispense, he did not keep a register. He admitted prescribing morphine and heroin as snuff to avert serious consequences and to prevent patients becoming troublesome. He had agreed that there was little possibility of success unless strict supervision were maintained, and undertook to decline to prescribe for patients whom he could not supervise. He had written a letter confirming this. On August 6th, 1925, he had gone to see Dr. Connor about a telegram from Miss P. which the Home Office had intercepted. Dr. Connor had told him that Miss P. had been his patient for about four years and had been taking heroin to relieve a cough; she had been in a nursing home and had been cured of the heroin habit. Dr. Connor had not given him the name of the home nor that of the medical attendant. Miss P. had then, according to Dr. Connor, gone on a voyage to South Africa and had there succumbed again to the habit; he was now supplying the drug solely by reason of her addiction, and did not hope to cure her. In addition to other amounts he had prescribed 5 gr. on June 16th and 4 gr. on June 17th, also he had prescribed 4 gr. on July 4th and another 4 gr. on the 5th. Dr. Connor said that she had had 12 gr. on June 6th as she was starting for the Hebrides; he could not explain how he had come to prescribe on the two consecutive days, June 16th and 17th. He could not remember having received a telegram nor having despatched a prescription in response.

Mr. Hawke cross-examined.

Counsel then called Dr. M. C. Vivian, who said that Miss P. had come to her as a resident patient, in answer to a standing advertisement, on March 31st of this year, to be cured of the heroin habit, and had stayed till May 6th. Witness had reduced her in five weeks from 1½ gr. a day to 1/10 gr. She had tried other drugs as substitutes without success. Another fortnight, she thought, would have produced a total cure. Nothing in Miss P.'s physical condition, except her addiction, had justified her receiving heroin. During the time Miss P. was with her she had written to Dr. Connor asking him not to send her any prescriptions or drugs; she had received no reply. Cross-examined, the witness said that Miss P. had left while she was out and had given no notice. In answer to a question from the President, witness said she had written to Dr. Connor because Miss P. had told her that he had been prescribing and she was afraid that the patient would continue to receive prescriptions.

Counsel then called Dr. A. L. Baly, assistant superintendent of Lambeth Hospital, who said that Miss B. had been admitted on March 31st of this year. He had not seen her until the morning after she arrived. She had been in a very agitated state and had told him that she was suffering from asthma that could only be relieved by morphine. She had had a quarter of a grain on admission. Although she had been admitted on the representation of the relieving officer under the Lunacy Act, she was not certifiably insane. She was still in the hospital and had had no more morphine, as he had not considered it necessary. Her health had considerably improved. Cross-examined, de admitted that it was a remarkable thing that hepriving her of morphine had been so successful. Replying to a question from the President, he said that she was showing signs of bronchitis. He had known that she had been taking morphine and had seen a copy of a prescription for two-thirds of a grain twice daily. He had given her a dose of sterile water, which had had the required effect; he had often known this happen.

Counsel then called Detective-Inspector W. Burnby, who said that he had interviewed Dr. Connor on several occasions. He deposed that he had taken with him several originals and copies of prescriptions, including those made out for Miss Y., all of which, with one exception, were ordered for surgery use. Miss Y. had been convicted on August 24th, 1922, for forging a prescription for morphine; she had been released to a home and admonished by the sheriff. He had told Dr. Connor that she was being treated by another doctor in Glasgow. The doctor had said that he saw her once a month when she came and stayed at an hotel in London. He had told Dr. Connor that she had been convicted for forgery. Dr. Connor had said that he would not have treated her if he had known that she was being treated by another doctor. The doctor had said, when he interviewed him on Dec. 24th, 1925, that Miss Y. spent considerable time in London, as she was a rich woman and had property at Tottenham, and that he knew she was being treated by another doctor and was writing to her about it. He had said that he had kept no accounts for two years and that his charges were one guinea per visit, and that on Dec. 11th he had received a money order from Miss Y. for £8 at the rate of one guinea per visit. The officer said that he had inspected the register of the chemist who had been supplying the doctor and had found that, out of 13 orders that he had fulfilled, only one was to the prescription of Dr. Connor. The doctor had told him from his books that he had received 575 gr., but the chemist's register showed over 800. The doctor had explained that he must have made a mistake; that the morphine had been obtained for surgery use, and some of it had gone to Colonel S. G. Cross-examined as to whether he had used the exact term "register" in questioning Dr. Connor, witness maintained that he had. He knew Miss Y. by repute and believed that she throve on morphine and carried out her business well. He denied that he had stated in the criminal proceedings that Dr. Connor had been the ruin of one man.

The President pointed out that qualified medical practitioners were exempted from keeping a register if they kept a book in addition to a day-book.

Replying to the question of a member, through the chair, witness said that he understood that the charge of one guinea was for visits only, and that patients had to pay separately for drugs.

Counsel then called Dr. C. F. Dillon-Kelly, who stated that on the evening of March 29th this year he was called to see a patient, Miss B., in place of Dr. Moon, who practised near by. The patient's relatives had asked him to give her an injection of morphine as she was in a very excited state. She was putting on symptoms of bronchial asthma to an extent which, in his opinion, amounted to malingering. After talking to her for about a quarter of an hour he did not think fit to administer morphine, and Dr. Moon had later agreed with him. He had given her an order for admission to the Maudsley Hospital, but next day she had gone to the Lambeth Infirmary. Cross-examined, witness admitted that the patient showed some genuine signs of asthma and, in reply to a question from the President, stated that they were not as severe as they looked.

This closed the case for the prosecution.

Mr. Hawke then addressed the Council, setting forth the lines of the defence. Commenting on the principle laid down by Sir Travers Humphreys, he remarked that it raised the questions (1) of what a minimum dose was in the case of a confirmed addict, and (2) who was to be the judge of this minimum. He submitted that only a medical man could be permitted to decide these points and that no official idea, even of those who were performing the valuable service of combating a real evil, could be allowed to determine them. He considered also that there were certain considerations of

which this principle did not take account—e.g., that addiction is in itself a disease. This view was confirmed in the report of the Select Committee of inquiry, who asserted that it might be necessary to administer dangerous drugs to confirmed addicts in non-diminishing doses in order to enable them to live normal and useful lives. Apart from this there were cases of people who, on account of some injury, lived in continuous agony, and it was surely permissible to administer drugs to these in mercy. In addition to relying on this principle, said Mr. Hawke, Sir Travers Humphreys had suggested an interpretation for certain facts which put a sinister construction on the conduct of Dr. Connor and implied that he was not influenced by medical instincts but by rapacity. In general contradiction to this view he had put into court a testimonial signed by many eminent and trustworthy people affirming the integrity of Dr. Connor. Nor had his client any financial reasons for rapacity. Many general practitioners treated drug addicts, but these formed a very minute percentage of their practices. Dr. Connor saw 400 patients a month; in fact, in February he had seen 521, and of these only five were drug addicts. The proportion averaged about 1 per cent. Again he could recall a police-court case against a drug addict for forgery, in support of which charge Dr. Connor had been called as a witness. The magistrate had actually placed the prisoner in Dr. Connor's hands for treatment, and Dr. Connor had looked after him for some time and had reported to the magistrate weekly. He did not hold up Dr. Connor as a man of very methodical habits of book-keeping. Nevertheless the whole bulk of the Home Office's information which had been used as evidence had actually been supplied by Dr. Connor himself, with the exception of the telegram. As regards the morphine that he had ordered for surgery use, his books showed when he had it and what he did with it. If Dr. Crosse had understood Dr. Connor to say that he would rather get rid of drug addicts by giving them prescriptions than attempt to cure them, then Dr. Connor repudiated the suggestion entirely.

In the case of Miss P., when Dr. Connor said that he had no record of having received a telegram from Scotland he was telling the truth. Dr. Connor had a great number of patients and it was quite reasonable that he should have forgotten it, and there was no evidence that he was seeking to conceal anything. These things had taken place many years ago. In fact, he had actually told Dr. Crosse that he had prescribed for this lady on the very day the telegram was said to have been sent, and the prescription appeared on the list which he had furnished to Dr. Crosse from his records. Dr. Connor had been prescribing for Miss P. 5 gr. every four or five days and this, in his judgment, was the right dose for her. He had allowed her 30 gr. at one time to take with her to Scotland. In answer to the question whether he had really made any effort to cure this patient, he had actually advised her to go into a nursing home and she had gone. Later on she had re-acquired the habit in South Africa and had come back taking as much cocaine and heroin as she could get hold of. He had re-started her with the dose that he thought proper, about 3 gr. a day, and from March to May had reduced her to about 1 gr. to 1½ gr. a day, at which amount she had settled down. She had then gone to Dr. Vivian's home, and this doctor had reduced her to 1/10th of a grain a day. Dr. Vivian had said that another fortnight would have cured Miss P. The departmental report, however, stated that the most difficult part of the treatment was the reduction from the last ½ gr. to zero. The significance of this was that when Miss P. was reduced to 1/10th of a grain she had bolted. He suggested that Dr. Connor had done all he could.

Of Miss B. he would only say that she was already taking morphine for asthma and that Dr. Connor had prescribed the amount he thought fit. The paucity of this amount had actually reduced Miss B. to such a state that she had had to be sent to hospital under the Lunacy Act.

As for Miss Y., every dose she had had was recorded in Dr. Connor's books, and, since these employed medical formulæ, it was natural that the police officer should not have been able to understand them. Dr. Connor had given him every assistance and had gone over them with him in detail. Miss Y., according to her own story given in the police-court, had been an addict for 20 years, and Dr. Connor had supplied her with amounts which might seem considerable. But she was an exceptional woman and, although she consumed even more morphine than Dr. Connor gave her, she was healthy-looking and freshly-coloured, and conducted her own business. Inspector Burnby had said that she throve on it. This was obviously a case of a confirmed addict receiving a minimum dose to enable her to lead a useful life.

Counsel did not know how the case of the Colonel fitted into Sir Travers Humphreys's principle. His spine had been crushed and he was suffering excruciating agony; presumably it was forbidden to give him morphine as no attempt was being made to cure him. Dr. Connor could say that he knew of an operation which would relieve the agony while leaving the patient permanently paralysed. Meanwhile he was administering the drug in order to relieve this agony. Counsel submitted that he was perfectly entitled to do so in the interests of humanity.

The case of Mrs. D. showed a definite attempt on the part of Dr. Connor to cure her addiction by diminishing doses. In December, 1922, when he had begun to treat her, she had been receiving 120 gr. of snuff in 18 days. By June 23rd, 1923, she was down to 48 gr. a month; in July she had received 34 gr. and in August 28 gr. Thereafter her average was 35 gr. per month. In 1924 she had left London for the North of England, and Dr. Connor had refused her request that he should continue to treat her except on condition that she remained under his personal supervision. Dr. Connor could bring evidence of cases of apparent addiction which he had apparently cured and who had not returned to him.

In regard to the police-court convictions Dr. Connor had been fined because out of a large number of prescriptions for Miss B. he had omitted the address from one. The other convictions were for failing to enter morphine in a special register. He was not a regular dispenser, and the properly qualified medical man was exempt from keeping such a register if he kept a day-book and any kind of a note-book to show what he did with his drugs. The Chairman of Quarter Sessions, in considering the appeal, had been satisfied that the utmost of which Dr. Connor had been guilty was gross carelessness, and the fines had been the utmost which could be imposed for inadvertence.

Counsel then called Dr. Connor on his own behalf, and Mr. Roome examined him. Dr. Connor testified that he had been 35 years in practice and four years at his present address, also that the proportion of his drug addicts to his other patients was less than 1 per cent.

Miss P. had come to him suffering from phthisis and had been accustomed to drugs before he knew her. He had treated her for symptoms as they arose. She had gone into a nursing home on his suggestion to be treated for the heroin habit, and had been cured. When she had come out of the home she had gone on a voyage to South Africa, but, since she had been able to obtain unlimited supplies of cocaine and heroin out there, she had come back as bad as ever. He had cut off her cocaine and had reduced her heroin gradually to 1¼ gr. a day. Below this he had not succeeded in keeping her. In his opinion his treatment of her was correct. His plan had been to get her down as far as he possibly could and then send her to a nursing home. He had made no concealment in his books of the drugs he had been giving her and had written a prescription in every case.

Miss B. had been suffering from asthma and was accustomed to taking morphine. She had not told him that another doctor had been prescribing for her. He had done his best to reduce her doses, but it had

been a continual struggle. He had been genuinely trying to treat her addiction.

In Miss Y.'s case every supply, other than by direct prescription, had been in accordance with his books. Miss Y. was his wife's personal friend and visited them, and he had considered that she was under sufficient supervision. Sometimes, instead of sending her a prescription, he had given the chemist an order and asked him to post the bottle off; he had never sent her any himself. This was for Miss Y.'s convenience. When she ran short she became very excited, and it was bad for a drug addict to be subjected to worry.

The President asked the witness in what form he had given these orders to the chemist. The witness replied that sometimes he had ordered it in Miss Y.'s name and that on some occasions he had told the chemist to send it direct to her and had put it down as for surgery use. In every case he had made a record in his day-book.

Continuing his replies to examination, the witness said that Colonel S. G. had had his spine crushed and lived in continual agony. He had supplied him with large amounts at a time because he had found it difficult to get supplies in Paris, where he lived. It was impossible to cure him altogether. The witness had tried several drugs and morphia was the only one that had been any use.

He had reduced Mrs. D. to about 35 gr. a month; in 1924 she had left London for good and he had declined to continue treating her, as he had thought he could not look after her properly. He said that he had succeeded in curing four cases of addiction out of 12 in two years. He had never meant to suggest to Dr. Crosse that he gave addicts a drug in order to get rid of them.

In reply to cross-examination by Sir Travers Humphreys, witness maintained the truth of all he had said and denied any intention to conceal his supplies of morphine to Miss Y., also that he had known she had been convicted for forgery and was being treated by another doctor in Glasgow.

After the Council had deliberated in camera for an hour and a quarter the President announced the decision as follows:—

Mr. Samuel Grahame Connor, I have to inform you that the Council have given careful and prolonged consideration to the three paragraphs of the charge brought against you. The first and second charges are that under the circumstances set out you have prescribed or supplied dangerous drugs otherwise than in the course of bona-fide medical practice; the Council have not found these charges proved to their satisfaction.

The third charge is with regard to your convictions on three summonses under the Dangerous Drugs Act; these convictions have been proved to the satisfaction of the Council. Having regard to the judgment in the court of appeal, they have decided not to proceed to direct the erasure of your name from the Medical Register in respect of these convictions, but to postpone judgment on the question for one year, expecting you in the interval to obtain evidence from persons of position in the profession and otherwise as to your character, conduct, and methods of medical practice during that time, and on the proper request from the Registrar to supply the names of such persons who are ready to testify. You will be required to come before the Council this time next year on a date which will be notified to you, and to satisfy the Council on the points I have mentioned.

This, I think, is the first case brought before the Council on a conviction under the Dangerous Drugs Act, but they have already issued a warning notice that not only convictions but contraventions which have not been the subject of convictions may be dealt with by the Council as offences which render a registered medical practitioner liable to have his name erased. I will read the warning notice which, I take it, you have already received, but which I desire to read in public for the information of the profession.

"The contravention by a registered medical practitioner of the provisions of the Dangerous Drugs Acts and the regulations made thereon may be the subject of criminal proceedings, and any conviction resulting therefrom may be dealt with as such by the Council under the powers given them by Section 29 of the Medical Act. But" (and this, said the President, is the important point) "any contravention of the Acts or the Regulations involving an abuse of the privileges conferred thereunder upon registered medical practitioners, whether such contravention has been subject to criminal proceedings or not, will, if proved to the satisfaction of the Council, render a registered medical practitioner liable to have his name erased from the Medical Register."

I call your attention, Mr. Connor, to the terms of that warning notice, and although I know that upon the convictions which have been obtained you have already been punished, it is desirable, considering your methods of practice, that you should be put on probation for one year.

## REPORTS OF COMMITTEES AND OTHER BUSINESS.

### MONDAY, MAY 31ST.

At a meeting of the Executive Committee the official notification was made of the reappointment of the following members of the Council: Dr. Wardrop Griffith, Dr. H. L. Eason, Dr. A. F. Dixon, and Sir James Hodsdon.

The following names, erased under Section 14 of the Medical Act, 1858, were restored to the Medical Register: Thomas G. Burnett, George H. Coke, Ahmed R. W. Dina, Victor T. W. Eagles, Thomas V. Hunter, William A. McEnery, Henry G. H. Monk, Samuel K. Norris, Ernest A. Runting, Alice I. Shaw, Henry J. Villiers.

*The Irish Free State and Medical Registration.*

The Executive Committee approved a suggestion, which had been received from the Rt. Hon. T. M. Healy, Governor-General of the Irish Free State, to the effect that a conference should take place between the representatives of the British Government and of the Irish Free State with a view to the making of permanent arrangements in the matter of medical registration.

*Society of Apothecaries: Honours Certificate in Obstetrics.*

A communication was made recently to the Privy Council by the Society of Apothecaries as to the institution of a registrable diploma for proficiency in obstetrics, when a reply was sent that fresh legislation would be required before this could be done. The Society, having later applied to the Privy Council for guidance as to the issue of an Honours Certificate, that body referred the point to the General Medical Council, who now advised that it would be inexpedient for the Privy Council "to express beforehand an opinion on a subject which might come before them officially and perhaps judicially."

The Right Hon. Edward Hilton Young, D.S.O., D.S.C., joined the Council as Crown Nominee for five years from May 23rd, 1926.

The Finance Committee's report was laid before the Council by the Chairman and adopted unanimously.

Mr. Norman C. King was reappointed Registrar to the General Council and thanked by acclamation for his work in surmounting the difficulties created by the strike.

The session closed with a vote of thanks to the President.

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FLOATING REST HOMES ON THE VOLGA.—The Russian Red Cross reports a new development of prophylactic work against tuberculosis. The Moscow Health Department is organising this year fortnightly cruises along the Volga and Kami rivers in newly-repaired well-equipped vessels. It is hoped thus to provide holidays for 2400 workers this summer.

# Reviews and Notices of Books.

## CHRONIC INFECTION OF THE JAWS.

By STANLEY COLYER, M.D., M.R.C.P., D.M.R.E., Radiologist, Mildmay Mission Hospital; late Assistant Radiologist, Royal Dental Hospital. London: H. K. Lewis and Co. 1926. Pp. 76. 10*s*. 6*d*.

THIS book consists of a short radiological and clinical survey of the subject of chronic infection of the jaws. The author has had extensive experience of the clinical practice of dentistry and of general medicine outside his specialty, so that his conclusions as to the significance of the radiological aspects of jaw infections merit respect. Of the two parts of the book, the radiological study is the more interesting. During the last few years Dr. Colyer has put forward in various publications his views on the significance of dental radiographs. He believes that certain minute changes in the appearance of the bone are indicative of infection and have thus a definite diagnostic value. He carries the interpretation of dental films much further than do many of his colleagues, and believes that when correctly examined they may yield information which could not possibly be gained by unaided clinical examination. Dr. Colyer here gives an account of the normal film-picture of the teeth and jaws, as well as of the appearances occurring in disease, and the significance which he believes may be attached to these. Quite apart from the gross apical rarefaction so often seen, he describes small areas of rarefaction which may exist in the deeper part of the bone. According to the author these small areas can be distinguished from nutrient canals by the pattern of the surrounding bone. Dr. Colyer's views have attracted considerable interest among dentists, but while the appearances described by him can frequently be seen in good dental films, there is not yet unanimity as to their significance. It seems probable that much of what Dr. Colyer has to say is correct, yet until there is independent corroboration by methods of examination other than radiography, his views must still remain hypothetical. But before we can allow of a high value being attached to this appearance as a diagnostic sign, still more before we should allow it to influence treatment, there ought to be some corroborative evidence. When apical rarefaction as seen in a film is assumed to indicate infection, the facts that such areas are absent in normal jaws, and that the soft mass of tissue which frequently comes away when the affected teeth are removed shows microscopic signs of an infective process, give independent support to this assumption. There is prima facie evidence that the current value attaching to such an appearance in a radiograph is more or less justified, though even here there are obvious pitfalls, for the radiograph does not enable us to distinguish with certainty between an abscess and a mass of innocuous epithelial cells. If it were possible to provide corresponding confirmation of the accuracy of Dr. Colyer's interpretation of the radiographic signs of infection in the jaws, their value would be greatly strengthened. It might not be easy, but it should be possible to get films taken of the jaws in a certain number of post-mortem cases with pyorrhœa. If a film revealed those changes which Dr. Colyer considers to be indicative of deep infection, then sections could be made from the jaws which would either confirm or disprove his views. It is just because we are impressed with the possible importance of Dr. Colyer's hypotheses, and because we feel that his work is so suggestive, that we consider that further investigation by other methods is demanded.

A notable feature of the book is the large number of very beautiful reproductions of films showing both normal and pathological conditions. Dr. Colyer laments the inability of the process block to reproduce the finer details seen in a good film, but these illustrations are certainly among the best we have seen. The book should be studied by every dentist and radiologist. They may not always find themselves in agreement with the author, but they can hardly fail to be impressed both by his evident sincerity and the thoughtful and logical sequence of his argument. If the perusal of his book leads to a more careful examination of dental films by transmitted light in a viewing box, Dr. Colyer will have written to sound purpose.

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## DISEASES OF CHILDREN.

By H. C. CAMERON, M.D. Cantab., F.R.C.P. Lond., Physician-in-charge of Diseases of Children, Guy's Hospital. London: Humphrey Milford, Oxford University Press. 1926. Pp. 199. 5*s*.

THE object of the Oxford University handbooks is to provide a general survey of various branches of medical science. This object has been attained with striking success by Dr. Cameron in this little book, which is written with the charm and insight which his former writings have led the reader to expect from him. It is in no sense a text-book, and should not be used to replace one, but the reader will gain from it a more balanced view of the significance of the facts presented in text-books of pediatrics. The essential differences in the outlook with which the practitioner should approach the study of child and adult patients are set out in a lucid and convincing manner, and important points, such as the small part played by drugs in the treatment of infants, are brought to notice. Each chapter comprises a review of the special problems which arise in dealing with some period of development or some common group of symptoms, such as diseases of the newly-born, the various digestive disturbances, nervous unrest, catarrh, predisposition to disease, and the effect of conduct and management upon health. The chapter on diet, which includes artificial feeding of infants, is a triumph of condensation, and will greatly assist the student to assimilate the wealth of lengthy and contradictory accounts with which he will sooner or later be faced.

This book may be strongly recommended to students and to all practitioners who are concerned with the treatment of children. In particular medical men and women embarking on general practice will be wise to procure it, and will gain from it an insight which is not always obtained from hospital routine into some aspects of a most important branch of their work.

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*Kinderheilkunde.* By Dr. R. LEDERER, Vienna. Berlin: Julius Springer. Pp. 160. $1.65.

THIS monograph forms a unit of Dr. Julius Bauer's "Konstitutions-pathologie in den medizinischen Spezialwissenschaften," and has as its object the recognition and estimation of the constitutional element in growth, development, and disease in children. Purely hereditary diseases such as hæmophilia are not discussed. The term *constitution* is used in the purely genotypic sense, referring only to factors transmitted by the germ-plasm. The first chapter is concerned with general considerations on heredity, predisposition, and their connexion with the nervous and endocrine systems. In the chapter entitled Constitution and Growth various examples of diminished growth—dwarfism, infantilism, infantile atrophy—are considered, and an attempt is made to differentiate in each case the (endogenous) hypoplastic element from the conditioned or hypotrophic element. The most speculative and controversial part of the work is found in the chapter on Constitution and Habitus; the author adopts the classification of Sigaud in preference to that of Kretschmer, and attempts the division of infants and children into his four types—respiratory, digestive, muscular, and cerebral. The morphological characteristics of these types are described at some length and illustrated by photographs. The final section on Constitution and Bodily Condition contains an analysis of the ætiological factors of some pathological conditions characteristic of childhood, particularly the chronic nutritional disorders. Special attention is given to

the work of Czerny and Finkelstein on hydrolability and the exudative diathesis. Recent work on the ætiology of rickets and of spasmophilia is reviewed in a well-balanced and critical manner; the author concludes that in spite of the apparent predominance of environmental or nutritional factors in the production of these states, there is a true endogenous constitutional factor consisting of a displaced relationship between the mineral constituents of the organism.

Dr. Lederer has presented with great ability his views on an aspect of medicine which is claiming an increasing amount of attention, and this monograph will provide much that is of interest to advanced students of the subject.

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PUBLIC HEALTH LABORATORY WORK (CHEMISTRY).

Eighth edition. By HENRY R. KENWOOD, C.M.G., M.B., F.R.S. Edin., Emeritus Professor of Hygiene, University of London. London: H. K. Lewis and Co. 1925. Pp. 369. 12*s*. 6*d*.

THE chemical requirements of students of public health are adequately fulfilled by Prof. Kenwood in a volume of less than 400 pages. This in itself is an achievement. The essentials of each subject are clearly defined and the descriptions of what to do and how to do it are lucid. Certain sections are really excellent; others give the impression that the author is not greatly interested in the subjects dealt with. It is regrettable that the first few pages are among the less carefully prepared passages. It is difficult to believe, for example, that Prof. Kenwood has ever himself obtained precipitates of ammonium salts, of nitrates, or of the chlorides of sodium or potassium which he has weighed after ignition in the manner here described, or that the descriptions of the balance, the spectroscope, the polariscope, which he appears to associate with the refractometer, and the burette represent his considered view of these instruments. On the whole, however, methods of examination of water, sewage, air, foods, and disinfectants are well described. The chapter on water analysis is especially good. The methods discussed are for the most part well chosen, and the real difficulty of interpreting results is largely removed by the many examples of analyses and reports. The author justly devotes attention to the microscopy of water. The plates of objects found in water are hardly up to the standard of the text. Dibdin's microfilter is not mentioned; it is a great improvement on the Blyth's tube which is described. The following sentence from this section of the volume might well be hung up in all water laboratories: "Between an undoubtedly bad water and an undoubtedly good water there are waters regarding which no opinions ought to be advanced unless advantage is taken of a careful local inspection to detect any possible source of pollution and both a bacteriological and a chemical analysis are performed."

The chapter on sea water is marred by two inadequate and unrepresentative analyses. This is the more to be regretted as the author and F. N. Kay Menzies have done excellent work on criteria of purity of sea water. The statement that sea water does not contain phosphoric acid might be challenged. The small amount it does contain is a determining factor in the growth and decay of plankton and thus has an important bearing on fish life. Brucine is not, we hold, a trustworthy reagent for detecting nitrates in sea water.

Sewage and mud are dealt with adequately in 12 pages, whilst 47 pages are given to air. No reference is made to Dr. J. S. Owens's excellent devices for determining suspended impurities in air or to the work of the Meteorological Office Committee on atmospheric pollution, though other methods of collecting suspended matter are given.

The author writes wisely on preservatives. He points out that their use facilitates an uncleanly, slovenly treatment of food and renders it possible to preserve articles in incipient decomposition for some time with every appearance of freshness. Some reference to hydrion-concentration and the pH of Sörenson might usefully have been added to the chapter on acidimetry and alkalimetry, and a more modern treatment of these subjects might with advantage be adopted in a subsequent edition. A bibliography would be a useful adjunct.

Throughout this text-book Prof. Kenwood shows sound judgment based on ripe experience.

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DICTIONARY OF APPLIED CHEMISTRY.

Revised and enlarged edition. By Sir EDWARD THORPE, C.B., LL.D., F.R.S. London: Longmans, Green and Co. 1926. Vol. VI. Pp. 791. £3.

ON the death of Sir Edward Thorpe in February, 1925, it was found that much progress had been made with the two last volumes of this dictionary. The final revision has been carried out by Dr. H. Forster Morley, and it is hoped that the final volume, containing an index to the whole work, will be published before the end of this year. The sixth volume of this magnificent dictionary deals with subjects comprised within the letters "S. Acid" to "Tetryl." Most of the articles have been written by authoritative contributors and constitute valuable summaries of the chief branches of applied chemistry. Among the subjects of especial interest to the medical man may be mentioned salicylic acid and its derivatives, santonin, the treatment of sewage, silver compounds, soaps, the sugar in blood and its estimation. Prof. Barger contributes an interesting and fairly comprehensive article on synthetic drugs; the information relating to taste, tea, and terpenes is well up to date.

In this dictionary reliable information can be quickly collected on almost any subject connected with the science of chemistry; moreover, the liberal use of references to published work indicates the direction in which more complete study can be made.

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BIOLOGICAL MEMORY.

By EUGENIO RIGNANO, Professor in the University of Milan, &c. Translated with an Introduction by E. W. MACBRIDE, D.Sc., LL.D., F.R.S. London: Kegan Paul. 1926. Pp. 253. 10*s*. 6*d*.

Prof. Rignano makes a bold effort to account for those differences between living and non-living matter which have already led to the production of so many theories. By memory he does not indicate the power of conscious recall of past experiences, but rather the power of repeating habits that date from the previous experience of the individual or the race, and this power is the characteristic of living tissue. He elaborates a centro-epigenetic hypothesis, in terms partly physiological and partly vitalistic, which calls for a trophic nervous energy passing from nucleus to nucleus and leaving in its path a "specific accumulation" which can originate by its decomposition exactly that kind of nervous current by the action of which it was deposited.

To the physiological reader such mixed hypotheses are provoking when they are produced as satisfying solutions of the great problem. But, fortunately, the author indulges in a friendly controversy with Prof. Bottazzi, a partisan of physico-chemical theories of life—which theories may be equally provoking to those who cannot be content with the effort to explain living and non-living matter by a single conceptual system. In his reply to criticism, Prof. Rignano frankly admits ignorance of the physiological basis of the mnemonic faculty or of the property of forming "specific accumulations." His theory is, he claims, merely an attempt to group together under one system a number of facts concerning heredity and kindred subjects for which no single generalisation has yet been offered. Thus viewed, his theory comes to be ranked as legitimate hypothesis and may be compared with Darwin's ideas of pangenesis and Weismann's theory of the continuity of the germ plasm. Like those, it may be expected to arrest attention and to stimulate further attempts to understand the basis of the phenomena studied.

THE LANCET.

*LONDON: SATURDAY, JUNE 12, 1926.*

## X RAY TREATMENT OF CANCER.

X RAYS have now been tried in the treatment of malignant disease for 25 years; some of the early beneficial results were obtained with rays of long wave and correspondingly small penetrating power, the dosage being empirical. As time went on shorter rays of greater penetration were used in the hope of reaching deeply situated organs. During the war a method of accurately estimating the quantity of X rays emitted from a tube was worked out in Germany, and a system was evolved by which dosage could be measured, not only on the skin, but in the depths. The quantity of rays which any one portion of skin would tolerate was taken as the unit, and by means of crossfire through different ports of entry doses larger than could be borne by the skin were given to tumours at a depth. Reports of the results obtained by these massive doses, brought to this country by Dr. REGINALD MORTON and others five years ago, were more than encouraging, especially those from the clinic at Erlangen under Prof. WINTZ, where administration of massive doses of penetrating rays continuously for many hours resulted in the "clinical cure" of 80 per cent. of cases of uterine carcinoma so treated—that is to say, they were still well three years or more after. The Erlangen results were, in fact, so superior to those obtained by surgical methods that, as Dr. MORTON stated in a recent letter, surgery was abandoned at this clinic for cases of malignant disease in the female. The results obtained in this clinic were, however, not reproduced by others who tried the method; many patients suffered severely from the inevitable destruction of red cells and failed to recover their hæmic equilibrium; in some cases death followed as an immediate or remote result of the severe reactions.

The original Erlangen technique proved unsuited to the majority of cases seen in this country. For this reason, both here and in Stockholm under Prof. FORSSELL, a variation of the single massive dose method was introduced and the majority of workers now divide up the large dose over several days. There are grounds for believing that tissue cells, whether normal or malignant, are more radio-sensitive during certain stages of mitosis than at others, and by dividing the dose it is hoped to catch all the malignant cells at a susceptible time. There is also the constitution of the patient to be borne in mind. As Dr. F. HERNAMAN-JOHNSON puts it,[1] radiation treatment must be attuned to the estimated power of constitutional response in the individual patient. The results so obtained have been extremely variable, and even the keenest radiologists admit disappointment and the inability to forecast the result with any feeling of confidence. The cases which they undertake, however, are almost always in extremis or at all events beyond the reach of surgery. Dr. HERNAMAN-JOHNSON writes bluntly: "To British radiologists the treatment of carcinoma of the womb is of little practical importance, for they never see it." There is no material for the comparison of the results obtained by radiologists with those of surgeons, because they do not deal with the same kind of cases. There is, we believe, sufficient evidence to show that X rays (and, of course, radium) can do a great deal in certain types of cancer; rodent ulcer almost invariably disappears with small divided doses of X rays, and of all forms of internal cancer early carcinoma of the uterus is most analogous to rodent ulcer in its clinical behaviour. Prof. WINTZ himself has claimed a large measure of success in cancer of the breast. But in general the success so far achieved is not sufficient to justify radiologists in demanding that they should treat all early cases of cancer in advance of the surgeon. The position is complicated by the tendency on the surgeon's part, should the patient recover after X rays alone, to regard the diagnosis of cancer as incorrect, more especially as cases that are treated only by radiations are rarely sectioned. Spontaneous cure of well-established malignant disease is indeed not unknown. It may be taken as beyond dispute that massive doses of X rays will cause large tumour masses to disappear, but this experience is not synonymous with the cure of the primary disease. After irradiation of the primary lesion an existing metastasis may break into a fierce activity. The same phenomenon is, however, only too well known after operative treatment of a slow growing tumour, recurrences of an extremely active type making their appearance sometimes within a few weeks. There is strong evidence to indicate that any interference with a malignant growth may change its nature, whether this interference be operative or by means of radiations. Recent papers at the German X Ray Congress at Berlin seemed to indicate that, as regards cancer of the breast, the intensive treatment with rays of great penetrating power was not only ineffective but positively harmful. On the other hand, the statistics of the clinics in which rays of moderate penetration only were used were much more satisfactory, an experience which we believe is shared by the majority of radiologists in this country. Surgeons are divided in their opinions as to the value of post-operative irradiation of breast cases, and some of them have abandoned their use in breast cases after operation. Nevertheless, there are many surgeons who insist on post-operative irradiation as early as possible, not even waiting for the healing of the wound. LEWIS JONES recognised long ago[2] that in the X ray treatment of malignant disease there is "the strange phenomenon of the profound influence exercised by the rays, with a strange insufficiency so far as final cure is concerned." Cases are known in which the apparent disappearance of a local breast cancer after X ray treatment has reduced the breast to a condition in which operation could be undertaken, when section has still shown the presence of carcinomatous cells.

In some ways the position has not altered much since Mr. CECIL ROWNTREE wrote 14 years ago[3]: "Many surgeons consider X rays to be useless in the treatment of inoperable cancer. Some regard them as actually harmful when applied in frequently repeated doses; a few, a very few, have had experience of cases in which apparent cure has followed their application." And even in the present stage of knowledge there cannot be many radiologists who would press for sole responsibility in the treatment of early cancer cases on the strength of the admittedly good results of Prof. WINTZ in dealing with cancer of the cervix uteri. There are, however, a number

[1] Radiotherapy in Relation to General Medicine. Oxford Medical Publications. 1926.

[2] Medical Electricity. Edited by L. W. Bathurst. Eighth edition. 1920.

[3] Latham and English: A System of Treatment, i., 155.

of cases in which, though the cancer is early, operation is contra-indicated owing to some general cause. If these cases were submitted to irradiation on the lines suggested by Dr. MORTON and the results collected and published, the objects which he has in mind would be attained without contravening the principle, firmly established in this country, that early excision is the correct treatment for early cancer. Dr. PODKAMINSKY, in a much-criticised letter, quotes LEVY-DORN'S gibe that the proved successes of radiotherapy are two—epilation and castration. It is in fact the only agency we know which has a definite effect on malignant growth of all kinds.

## THE DENTAL BOARD'S BUDGET.

THE Dental Board of the United Kingdom has the disposal each year of a large sum of money, for the Board prescribes a fee of £5 for the annual retention of any name on the Dentists Register, apart from names which appear there by right acquired prior to the Dentists Act of 1921. This Act laid down that any moneys received by the Board after paying the expenses of administration should be devoted to dental education and research or other public purposes connected with the profession of dentistry at the discretion of the Board. Strong pressure has been put upon the Board to reduce the amount of this annual levy upon its registrants, many of whom are not well off, and Mr. F. D. ACLAND, Chairman of the Board, devoted the larger part of his address at the opening of its tenth session on May 25th to a consideration of the Board's budget. Should the present retention fee be adhered to, the income of the Board will be above £50,000 for several years to come. The general expenses of the Board amount to about £12,000, and there is a possibility, happily not yet realised, of incurring heavy legal expenses in taking important cases to the courts. A reserve of £11,000 odd is earmarked for the teaching schools and, with the surplus of the present year, should meet their legitimate requirements for some years to come. A grant of £5000 a year is made to research, an amount which Mr. ACLAND would like to increase, impressed, as he is, with the approach of recent work to the edge of knowledge fundamental to prophylaxis. Dental health education is costing the Board about £4000 a year; post-graduate lectures account for another £1500, and students' bursaries already granted will amount to £21,000 a year when in full swing. Setting all these items of expenditure against the income derived from the payment of 9288 retention fees, "we could," said Mr. ACLAND, "with a little squeezing and a little going slow, and a little luck, and a little willingness to dip into reserve, get along fairly well with an annual retention fee of £4 instead of £5."

If this were all, the question of Dental Board finance would be simple, but there is much doing in the immediate future. As soon as dental benefit is provided under the National Health Insurance scheme—and the provision is imminent—the amount available from approved society funds for this benefit will be not less than £2,000,000 a year, over 10 millions of insured persons becoming entitled to demand it. The extra demand for dental service which will result must be met by a sufficient supply of dentists. Before the war an annual entry of rather over 250 licentiates maintained a slightly increasing Register of about 5000 practising dentists. Now the Register is over 14,000 and the number entering the schools last year was only 345. "I do not believe," said Mr. ACLAND, "that a Register of 14,000 will be permanently maintained unless 700 students a year enter the schools, and this number is just over double the present actual entry." He went on to speak quite frankly of the fact that in a few years' time the absolute monopoly of dental practice now enjoyed by dentists may be difficult to defend and that in consequence a strong demand may arise for a lower qualification. Dentists now have the tightest monopoly enjoyed by any profession, but no one complains of it, for the fees charged cannot be represented to be in excess of the value of the work done. But what if alongside an increasing demand for dental services there should be a considerable fall in the numbers on the Dentists Register? Hitherto the Board has done all in its power to make easy the path of the entrant to the dental profession. It has assisted 147 students who would not otherwise have entered the dental schools, the average annual cost of each grant being £122. Last March there was keen competition for bursaries and an attempt was made to help as many as possible with the money available; 27 grants were then awarded at an average annual cost of £106. Continuing on that basis 75 students a year would be assisted. If, as has been suggested, the basis of awards is changed and prize bursaries of £80 a year for four years are offered to 66 students a year, this much could be done, but not more with an annual retention fee of £4. Knowing that there ought to be a much larger dental entry, shall the Board, by reducing the present fee, put it out of its power to increase the number to whom help can be granted? Taking a long view, Mr. ACLAND concluded that it would be unwise in the general interests of the dental profession and of the public to reduce the fee permanently at the present time. The tax should, however, be as easy as is consonant with enlightened administration, and the first motion, after the Chairman concluded his address, was to ask the Finance Committee to consider and report what reduction, if any, would be necessary in the special expenditure of the Board on education and research to permit the retention fee to be reduced to £4 or, alternatively, to £3 in 1927.

## SPA TREATMENT.

OFFICIAL courtesy has made it possible for a representative of THE LANCET to make a detailed investigation of the position to-day of ten spas in Western Germany which were formerly visited by foreigners, and on p. 1164 is given a brief account of his findings. Speaking generally, he found the methods of treatment employed in German spas substantially the same as those of British spas. Bath treatments, it is true, are given on a vastly larger scale in Germany, but since one patient can only use one bath at a time, the individual derives little benefit from this circumstance. Whilst our representative found numerous English-speaking German doctors and hotel employees, few of the bath attendants spoke any English; consequently, unless the patient speaks at least a little German, difficulties might arise. Accessibility must be considered; the six-and-a-half hour crossing from Harwich to the Hook, followed by a considerable train journey, may be a serious deterrent to patients in indifferent health. On the other side is to be set the intangible but very real advantage of complete change of scene in many chronic maladies which require baths. Complete removal from the toils of business life and domestic worry, the breaking of a vicious circle of bad habits, these aids to effective treatment are more readily achieved in novel surroundings, and it is no doubt on this account that spa treatment has become international. The gain is mutual, for visits from other countries to home spas should be set against the visits of our own people to foreign health resorts.

The German spa industry has fallen on hard times. Deprived of its former rich Russian clientèle and of practically all British and French visitors, efforts are being made to resume relations with other nations. Most of the spas are State concerns, and the State is spending money freely in keeping them up to date. The cost of treatment is a serious consideration for most patients nowadays, and it is doubtful whether a cure in a German spa can be obtained as cheaply by British people as in a home spa if the additional cost of travelling is considered, especially if the patient cannot travel alone. The value of the mark now corresponds very closely to that of the shilling, and the cost of treatments in shillings and marks appears to be much the same. The charges of first-class hotels in Germany are lower certainly than in this country, the daily rate being from 12 marks upwards. The cost of the baths may be a trifle lower, although a mud or peat bath costs 7 or 8 marks—7*s.* 6*d.* in this country. Medical fees in the German spas are, on the whole, lower than in this country, a first consultation for 15 marks, followed by subsequent consultations at 7½ marks, being a fair average. The Germans would appear to have more faith in the specific action of their mineral waters than some of our own spa doctors. Water-drinking and bathing never occupy a secondary place, consequently accessory treatments are much less employed, and there is not the same tendency to try to speed up the cure. A month to six weeks is the shortest course prescribed. The patient will have four baths a week and see the doctor on two of the blank days.

Nauheim treatment is given in many of the spas, though probably nowhere so well as in Nauheim itself. In this line of treatment Great Britain cannot compete until some source of thermal carbonated saline is tapped—which seems unlikely enough. Artificially aerated baths can, of course, be given anywhere, but it should not be overlooked that this is only one, and by no means the most important, of the hydrotherapeutic measures which are so beneficial in certain disorders of the cardiovascular system. Ems treatment has not been attempted seriously in this country, though most German spas have their inhalatoria and their gargling and spraying rooms. Our winter climate is so unkind to patients with chest complaints that it is doubtful whether it would ever be successful except in the summer months. But with these two exceptions our representative did not find any treatments given at the ten German spas which cannot be obtained equally well at home. A "cure tax" is levied in all German spas, and whatever may be said for or against it in principle it undoubtedly enables the spa management to provide music and keep up gardens in a style beyond the means of most British spas. Orchestras are, however, now so expensive that no Austrian spas are providing music this year, and, unless conditions improve, it seems possible that Germany may have to follow suit. There is a large supply of pamphlets in English about German spas. These would be of much more use if they specified clearly in what treatments and for what complaints the particular spa specialises. The claims are so wide as to be of little use to the practitioner seeking guidance as to choice of spa. It usually results in the practitioner sending his patient to the spa at which he happens to know a doctor. Nor is great harm done thereby as the principles of balneological treatment are the same everywhere.

## THE LISTER INSTITUTE OF PREVENTIVE MEDICINE.

AT the annual general meeting held on June 9th of the Lister Institute, it was announced that Prof. C. J. Martin has been granted three months sick leave, and that Prof. A. Harden has been appointed deputy director during his absence. Dr. Muriel Robertson has resumed duty after absence on sick leave. Dr. G. F. Petrie has been appointed bacteriologist in charge of the serum department in succession to Dr. MacConkey, who has retired after holding this post for 20 years. The Governing Body records its high appreciation of the services rendered to the Institute by Dr. MacConkey during this period. The Medical Research Council have continued to render support to the work of the Institute. Besides furnishing the salaries of the staff of the National Collection of Type Cultures, the Council has provided two whole-time workers in the department of bacteriology, Dr. H. M. Woodcock and Mr. P. Bruce White, one in the department of biochemistry, Dr. S. S. Zilva, and six in the department of experimental pathology, Prof. Korenchevsky, Miss E. M. Hume, Miss K. L. Soames, Miss M. Carr, Miss Henderson Smith, and Miss Leigh Clare. Dr. T. Lumsden's work on cancer is carried on under a grant from the British Empire Cancer Campaign. Accommodation for all these workers and the expenses of their researches are provided by the Institute. The various investigations in progress are summarised in the annual report. Prof. J. C. G. Ledingham is continuing his studies of the viruses of variola, vaccinia, and avian molluscum. It is hoped that the experimental findings may throw valuable light on the irregularities met with in converting small-pox to the vaccinial form—a transformation which involves increased virulence of the original virus for the rabbit and a diminished virulence for man. Dr. J. A. Arkwright has continued his observations on the variation of bacteria in vitro. Dr. H. L. Schütze is studying plague vaccine of various types. The work of this department includes also investigations into types of gonococcus, the pasteurisation of milk and bovine tuberculosis, scarlet fever and streptococci, hydrogen peroxide and bacterial growth, and other studies covering a wide field. The department of biochemistry is no less active. Prof. Harden is conducting experiments on the nature of the substance, contained in yeast and many vegetable extracts, which has a powerful stimulating effect on the growth of yeast and is considered by many workers to belong to the class of vitamins. Using lemon juice as the source of this material it has been possible to concentrate it considerably and to separate it from the antiscorbutic vitamin. The process of alcoholic fermentation, the synthesis of fat and carbohydrate by vegetable organisms, and the transformation of sugars are also being studied. In the department of experimental pathology the acid-base equilibria of blood has been investigated by micro-methods. Much time and attention has been devoted to the development of trustworthy methods for assay of the fat-soluble vitamins, here differentiated as the anti-ophthalmic vitamin A and the antirachitic vitamin D. It is now clear that vitamin D is not less necessary for growth than vitamin A. Some of the biological tests to be used in an international comparison of biological and colorimetric methods of titrating vitamin A are being carried out by Miss Soames assisted by Miss Leigh Clare in this department. The mechanism by which ultra-violet light acts upon the skin in animals is being studied by Miss Hume, Miss Henderson Smith, and Dr. N. S. Lucas. The recent publication from the laboratories of the Institute on foot-and-mouth disease, by Dr. Arkwright and his co-workers, has already been noticed in our columns, and this is true of many of the 47 publications issued from the Institute in the period under review. The income for the year was £50,000, mainly made up of £14,000 from interest on investments and £35,000 from sales of sera and vaccines and fees for investigations performed. There is an excess of income over expenditure of some £14,000, the expenditure being accounted for in detail as rent, salaries (£18,000), laboratory expenses (£4000), purchase, housing and feeding of animals, library and workshop expenses and repairs, renewals, and alterations. The stationery and printing accounts are modest and the travelling expenses singularly so.

# Annotations.

"Ne quid nimis."

## SIR FREDERICK MOTT.

As we go to press we learn with deep regret the death of Sir Frederick Mott. On May 26th he was taken ill in the train while travelling to Birmingham to visit the laboratory at Hollymoor Asylum. At the General Hospital, Birmingham, he was found to be suffering from widespread cerebral thrombosis from which he never rallied and to which he succumbed on June 8th. For some months he had slight premonitory signs, but characteristically he carried on with his duties as Honorary Director of Research on Mental Diseases to the Corporation and University of Birmingham without regard to his physical health. His death at the age of 72 will be deplored by all our profession, and especially will he be missed by those engaged in psychiatry and its large modern developments, for it was hoped that for many years he would still be in a position to stimulate and guide them.

His distinguished career and his scientific attainments give him a unique place in the medical world, but it is his genial personality, his wide range of interests, his humanity and enthusiasm, which will make his loss so deeply felt and regretted by all who have had the privilege of coming into personal contact with him. His reputation is international. He was well known abroad as one of the great scientists of England, who kept close touch with workers of all nations, and was the personal friend of many of them. His researches are quoted constantly in foreign literature, and he maintained to the last a keen interest in the work of other nations. In his own specialty of nervous and mental disease he was both clinician and research worker, equally at home by the bedside and in the laboratory, and in both displaying his sound sense and judgment of values. For many years he has inspired research workers, and his energy and enthusiasm has laid the foundation of a school of research into the physical factors underlying mental disease from which many valuable contributions have emanated. He was the first worker in England to confirm the discovery of the spirochæte of syphilis in the brains of general paralytics, and his labours and those of his collaborators have produced a great body of evidence concerning the changes found in the nervous and endocrine systems in dementia præcox. His researches were mainly concerned with morbid anatomy, but he also realised that this line of work had its limitations; he fostered biochemical and physiological inquiry in his laboratory, seeing clearly that the next step on the path towards the understanding of mental disease processes was likely to be taken in that direction. While his own work was chiefly directed towards investigating physical factors, he took a keen interest in the psychological and philosophical problems involved in mental and nervous disease, and the whole problem of the interrelation of body and mind. Some of his most recent writings have been on this subject. He always cared deeply for music, wrote on the brain and the voice in speech and song, and was recently still working on the comparative anatomy of the vocal apparatus and its cerebral representation; and he believed in music as a valuable aid in the treatment of mental disorder. It was largely owing to his energy and force of character that the scheme of his friend, Dr. Maudsley, for the establishment of a hospital for the treatment of early cases of mental and functional nervous disease came to fruition, and the Maudsley Hospital, to which the central laboratory of the L.C.C. mental hospitals was transferred, owes him a debt at least as great as to its founder, for his unfailing interest in all its activities.

A correspondent writes: "All those who have had the privilege of knowing him will always think of him with the deepest respect and affection. He took a human and personal interest in those who worked with him, was always accessible and ready to help, willing to hear any problem, and to bring his great range of knowledge to bear on its solution, thus inspiring everyone with his own enthusiasm. He was a great man as well as a great scientist, and a beloved teacher to the school he did so much to found."

The fuller obituary notice will appear next week.

## THE IMPORTATION OF FOOT-AND-MOUTH DISEASE.

THE origin in this country of fresh outbreaks of foot-and-mouth disease apparently unconnected with previous cases of the disease has long been a standing puzzle to administrators and farmers in spite of all the labours of that great investigator Sir Stewart Stockman, whose obituary notice appears on another page. A recent outbreak in Scotland, where the disease is comparatively very rare, has led to the detection of carcasses of pigs imported from Rotterdam with lesions of foot-and-mouth disease on them. These carcasses had already been received at three different places in Great Britain, two of them bacon factories, and had reached this country in two or more different ships. As a result of this disclosure the Ministry of Agriculture has issued an order prohibiting the importation of carcasses from continental Europe after June 3rd. The term carcasses includes meat, hides, bones, horns, hoofs, blood, and offals, except in the case of fully cured meat and hides. There was a strong presumption that the carcasses discovered were actually infective, and it is stated that direct experimental evidence was obtained that this was the case. The exact path by which the infection passed from the carcasses to living animals is not quite clear, but the explanation would be very simple if portions of the meat were given to pigs to eat and the disease then spread to other animals; failing this route other hypotheses could readily be framed. Though it has often been suspected that infected fodder may introduce the disease, the evidence for or against this possibility has in the past been so conflicting that it cannot be said to have been generally accepted as a very probable or frequent source of danger, and other explanations have been as freely suggested with no more certain support from ascertained facts. The chief argument against the transmission by such means is the rapidity with which infected material has often been found to become inactive at ordinary temperatures, especially if exposed to sunlight and drying. The German Commission of 1898 could not show that the virus would survive drying at all. French workers, however, found that under very special circumstances virus may be dried and remain active for a long time. Recently it has been determined that the conditions for the viability of the virus in dried discharges or blood are much more common than has been supposed. Among other facts bearing on the problem which have come to light in recent years are the infectivity of the blood and all the organs during the initial fever and during the first day or two of illness, and the rapid disappearance of the virus from the skin, blood, and other parts of the body after the earliest stages of the disease. Nevertheless, the epithelium, discharges, and blood retain their activity at cool temperatures for a long time if removed from the animal during the height of the infective period. It follows, therefore, that blood, tissues, and especially local vesicles in carcasses of animals killed early in an attack are likely to be a source of danger for some time after slaughter, especially if frozen or chilled. It has been known for many years that experimental feeding of animals with recently infected fodder may serve to induce the disease, and the infection of pigs by feeding with contaminated offal has been strongly suspected in other countries. From the consumer's point of view, apart from the probably very slight risk of infecting human beings through diseased meat, the question arises whether efficient inspection of carcasses would not obviate the need for a complete embargo. The fact that the carcass may be infective without characteristic lesions or after removal of obviously diseased

portions, and that blood and offals may also be infective largely disposes of this plea. The onus of proving freedom from infection must rest with those who would favour the continued importation of carcasses from neighbouring countries where foot-and-mouth disease is rife.

## THE BOTELHO REACTION FOR CANCER.

EVER since the Wassermann reaction gained recognition as a satisfactory aid to the diagnosis of syphilis the search for a method of serum diagnosis in cancer has been progressing. The latest claimant for notice is the "Reaction of Botelho," which forms the subject of a recent monograph by Beatrix Tedesco-Pollack [1] based on work done at the Hôtel-Dieu in Paris. The author of the reaction, whose identity is not made clear in the monograph, is, as our Paris correspondent has indicated, a pupil of Dr. Hartmann's, who, while making observations on the glycogen content of serum noted that certain cancerous sera gave a precipitate with the iodine-potassium-iodide solution used in the detection of this substance, a phenomenon which failed to occur with normal serum. The admixture of such a solution with the serum forms the basis of the reaction, which has been much refined by its originator and Mlle. Tedesco-Pollack. The test must be performed in an acid medium, and for this purpose either citric or nitric acid may be used; the latter is recommended. For the nitric-acid form of the reaction the following solutions are necessary:—

| | | |
|---|---|---|
| 1. | Nitric acid (pure at 36° Beaumé) .. .. | 1 c.cm. |
| | Physiological saline (7·5 per cent.) .. .. | 100 c.cm. |
| 2. | Metallic iodine, twice sublimated .. .. | 1 g. |
| | Iodide of potassium .. .. .. .. | 2 g. |
| | Distilled water .. .. .. .. | 210 c.cm. |

In its simplest form the reaction is performed as follows:—

Into a test-tube about 12 × 1 cm. are placed 3 c.cm. of the nitric-acid reagent and 0·5 c.cm. of the serum to be tested. Mix and then add the iodine-iodide reagent as follows. First pour in 0·5 c.cm. of the reagent and shake gently until the precipitate disappears. Wait 30 seconds. Add a further 0·5 c.cm. of the same reagent and again shake gently until the precipitate which reforms has either disappeared or sunk to the bottom of the tube. Lastly add a further 0·3 c.cm. of the reagent, again shaking gently and finally closing the mouth of the tube with the thumb and inverting it. A positive reaction is indicated by the persistence of a precipitate sufficiently dense to obscure the view of the filaments of an electric lamp when viewed through the test-tube.

Botelho, while working on his test, came to the conclusion that a high concentration of albumin in the serum tended to obscure a positive reaction, while vice versa sera low in albumin tended to give false positives. Mlle. Tedesco-Pollack has devised a technique for determining the albumin content of the serum by the refractometer and then by dilution with saline, bringing it to the optimum for the reaction. For details of this the original monograph should be consulted. Using this improved technique this worker claims to have been able to obtain positive results in over 90 per cent. of 145 cases of cancer, while 55 controls gave negative results in 85·5 per cent. of cases. These results are comparable with those achieved by their devisers with many other tests for cancer produced in the past, a fact of which Mlle. Tedesco-Pollack is well aware and which she duly notes in her extensive review of the subject. Since her monograph was compiled a further series of 200 cases has been examined at the Paris Radium Institute where Dr. Jacques Lavedan found a positive Botelho reaction in 85 per cent. of cases of breast cancer, but in only 35 per cent. of cases where the cancer was localised in the skin. He also found the reaction positive in certain cases of typhoid, diabetes, tuberculosis, and syphilis. The reaction accordingly, while it has some theoretical interest, does not as yet afford much practical help in diagnosis.

[1] Séro-Diagnostic du Cancer par le Réaction de Botelho, par Dr. Beatrix Tedesco-Pollack, Les Presses Universitaires de France, Paris, 1926.

## A MEDICAL VISIT TO BIARRITZ.

WITH a view to familiarising British medical men with the advantages of Biarritz as a health resort a party of London practitioners was entertained by Dr. Plantier, during the Whitsuntide recess, at the large hydropathic institution which he directs. The "Hélianthe," as it is called, although situated only a few minutes' walk from the centre of the town, has an uninterrupted view of the Bay of Biscay and the Western Pyrenees in front and abuts on open country behind. The climate of Biarritz is pleasant all the year round; there is little difference in the reading of the thermometer in the sun and in the shade, and no sudden chill at sundown. A stay at an institution of this kind is indicated for those who need sea air together with an equable climate; it is beneficial for that class of patients, so well known to practitioners, who are suffering from the stress and strain of modern life, or who need a complete rest after a serious illness or operation. Sufferers from dyspepsia, obesity, gout, and diabetes are well looked after, as a feature of the establishment is the supply of special diet to all who require it. Care is taken that all directions prescribed by the patient's own physician are carefully carried out. The "Hélianthe" has its own private path to the sea beach where there is safe bathing, while for those who prefer to bathe in the hotel a large swimming pool is provided. Turkish and light baths are available, as well as all the modern contrivances of physiotherapy. The high insolation prevailing at Biarritz makes it an ideal centre for heliotherapy; Dr. Plantier has provided spacious terraces for sun bathers, who are enabled to take their cure under the pleasantest conditions. The staff of medical assistants, nurses, masseuses, and electro-therapists, as well as the hotel personnel proper, is all chosen personally by Dr. Plantier and affords a happy example of team-work. The percentage charge for service robs the day of departure of its sting for less hardened travellers.

## OLEOTHORAX.

OLEOTHORAX is attracting some interest abroad. Dr. M. G. Kuss gives an account [1] of this new method of treatment introduced by Dr. A. Bernou [2] in 1922, which he has found useful in pneumothorax, whether artificial or spontaneous, and in empyema. Briefly, the method consists in filling the pleural cavity, partially or completely, with a non-irritant oil which has an antiseptic action on the pleural membrane. Several varieties of bland oil have been used for the purpose. Liquid paraffin has the advantage of being easily sterilised and of high viscosity, whilst it undergoes no change in the pleural sac and is only slowly absorbed. Gomenol, an essential oil distilled from a species of myrtle and popular in France, has been added to the paraffin in view of its bactericidal value and also relative non-toxicity. As much as 400–600 c.cm. of oil can be injected into the pleura at one time, but in the case of a healthy pleura without effusion an initial injection of 10–20 c.cm. is considered advisable. The oil should be warmed before use. It can apparently be safely used as a means of replacement instead of air, and Dr. Kuss gives exact details of its employment for this purpose. The effect of bland oils upon the growth of *B. tuberculosis* has recently been worked out by Ross [3] and Tulloch in Dundee, and from their work it may be assumed that oil, injected into the pleural cavity, will have an inhibitory effect on the tubercle bacillus. This, however, is only one small side of the question. Bacteria, especially tubercle bacilli, are not necessarily free in the pleural fluid or pus; the majority of the organisms lie beneath the pleural endothelium in the lymphatics of the subpleural connective tissue layer, and it is impossible to decide

[1] Revue de la Tuberculose, February, 1926.
[2] Vie Médicale, 1924, v., 149.
[3] Ross, G. R., and Tulloch, W. J.: Tubercle, 1926, vii., 265 and 321.

on our present information, whether or not the presence of oil on the free surface of the pleural endothelium affects bacteria in the subpleural layers. There is also the question whether oil, lying in the pleural sac for many weeks, will act as a foreign body and induce the production of adhesions. Finally, there is the question of the absorption of the oil. The small amount of work which has been done on the subject so far seems to indicate that the oil is absorbed, although slowly. The effect of such absorption has still to be worked out.

## TRAUMA AND MALIGNANT GROWTHS.

IN the clinical history of sarcomatous growths of bone there is often a story of a local injury having occurred at a comparatively short time before the first appearance of the disease. Speculation has been rife as to whether the injury has any causal connexion with the growth of the tumour and pathologists in particular have thrown doubt on this relationship, finding it difficult to explain how simple trauma can set in motion processes which ultimately lead to the formation of sarcomata. It has been asserted in standard text-books of surgery that it is a coincidence and nothing more when a growth arises in a limb which has been subjected to injury, or that the growth pre-existed and was lighted up by the injury into increased activity. Sixteen years ago Dr. W. B. Coley, whose experience in sarcoma of the long bones is unrivalled, brought forward a number of facts in order to demonstrate his belief that the growth of sarcoma of bone often did depend in some way upon antecedent injury. In a recent communication to the Southern Surgical Association of the United States, which is to appear in the *International Journal of Surgery*, Dr. Coley reaffirmed this opinion and brought forward additional cases which go far to establish trauma as the exciting cause of the formation of sarcoma. Of 360 cases observed by himself he obtained a history of previous injury in no less than 181, a percentage of over 50. The case-histories are given in detail and some of them are striking. For instance, a child of 5 fell against a corner of a table. She suffered from severe abdominal symptoms, for which a laparotomy was done on the third day. At this operation the surgeon found a hæmatoma in the transverse mesocolon. He let out the blood-clot and tied a bleeding vessel. The child recovered. Four weeks later symptoms recurred and in the abdomen was found a large tumour at the site of the injury. One month later exploratory laparotomy showed the abdominal cavity to be filled with sarcomatous nodules, apparently secondary to a large primary growth in the region originally contused. Dr. Coley cites cases where, following injury to a bone, a hæmatoma has appeared and been operated upon, where the X ray has shown no sign of malignant disease, and yet a few weeks later a growth has appeared. He points out that it is far commoner to get a history of injury in periosteal sarcoma than in central sarcoma and he endeavours to explain this difference. He cites the analogy of osteomyelitis, where it is well known that an injury to a bone may cause a latent infection to light up. Experiments with staphylococci thrown into the circulation in animals have demonstrated that infection of the joints and bones occurs almost with certainty when a local injury is produced afterwards. Dr. Coley himself believes that the association of injury with sarcoma is definite evidence in favour of sarcoma being due to external infective agents, the injury producing a local loss of resistance to infection. He suggests that local injury of the tissues gives rise to the formation of the specific factor required by the hypothesis of Gye and Barnard. Whatever may be the truth of the origin of sarcoma, no one can read these cases reported by Dr. Coley and remain unconvinced that trauma can play some part in its genesis.

## STATUS LYMPHATICUS.

THE diagnosis of status lymphaticus in cases of sudden death without obvious or adequate cause is perhaps not so popular as it was a few years ago, but is still sufficiently common to merit attention. Indeed, under the auspices of the Medical Research Council and the Pathological Society of Great Britain and Ireland a committee has been set up to inquire into the matter. A high proportion of these cases has followed the administration of brief anæsthetics for minor operations and it is difficult to avoid the conclusion that in some of them, at least, the diagnosis is open to doubt. Autopsy experiences in large cities lead to the conviction that a large number of the perfectly healthy children who are killed every year in street accidents exhibit hyperplasia of the lymphoid tissue throughout the body; yet the lorry or the motor-bus is so clearly the cause of death that status lymphaticus is never referred to. It is only when similar children succumb during operations for tonsillectomy or the like that a more recondite explanation is sought for. Apart from these instances, however, there are others when death follows upon a trivial injury or occurs with tragic suddenness from no apparent cause. Such a case is reported by Dr. James Miller in the *Canadian Medical Association Journal* for May. It is that of a young undergraduate, 19 years of age, who during a strenuous game of tennis on a bitterly cold day staggered a couple of paces and then collapsed, dying a few moments later. At the autopsy which was performed four hours later a condition of general lymphoid hyperplasia was found, with a persistent thymus weighing 14 g. The thyroid gland showed a mild condition of colloid goitre, and the brain was large and œdematous. Beyond some evidence of quiescent tuberculosis in the lung apices nothing else of any moment was discovered, and the diagnosis of death from status lymphaticus was given. On the face of it the diagnosis would seem fully justified, but on closer examination of the case certain omissions appear which diminish its value as a contribution to this important subject. It is strongly held by some authorities that a fine fatty degeneration of the cardiac muscle is the chief lesion in this condition and the determining cause of death, but no reference to the myocardium is made in this case. Again, E. Glynn has shown that sudden death may occur in the earliest stages of meningitis when the disease is practically not demonstrable except by bacteriological methods. Apparently, however, Dr. Miller made no bacteriological examination, and this is to be the more regretted since the patient had been in poor health for some time before his death. It is also noteworthy that a fortnight before he had had an unexplained fainting attack. The suspicion remains, therefore, that Dr. Miller's case is not one of true status lymphaticus, but is rather an example of cardiac failure from myocardial degeneration, if, indeed, an active infection can be ruled out. The question as to the existence of status lymphaticus is one of great importance. It is likely enough that the conception would not have fallen into the disrepute which it undoubtedly has had it not been, if not exploited, at least used as a cloak to cover ignorance. Only after the most thorough and systematic exclusion of other possibilities is it justifiable to make the diagnosis of status lymphaticus, and Dr. Miller's note will have fulfilled a useful purpose if it serves to point this moral.

## COMPLIMENTARY DINNER TO SIR STCLAIR THOMSON.

IT was a happy thought of the Section of Laryngology of the Royal Society of Medicine to give a complimentary dinner to the President of the Society, that leading laryngologist and sympathetic figure-head, Sir StClair Thomson. Upwards of 200 friends and professional colleagues, with their wives and guests of either sex, sat down to dinner on Friday last, June 4th,

at the Hotel Victoria to display their attachment to Sir StClair Thomson and recognition of his merits as man of science and official. The guests included the President of the Royal College of Physicians of London, two Vice-Presidents of the Royal College of Surgeons of England, Sir StClair Thomson's successor in the presidential chair of the Royal Society of Medicine, and many well-known physicians and surgeons. The proceedings were throughout of a very cordial nature. Dr. W. H. Kelson, President of the Section of Laryngology, made a happy speech from the chair in which he outlined briefly the guest's career and his high professional and social qualities, to which Sir StClair Thomson replied in a very happy manner. His anecdotes were good, his Shakespearean quotations were apt, and his acknowledgment of the compliment paid to him was a model of what such difficult speeches should be, both in sincerity and in the turning of phrases. His last quotation was Byron's celebrated exhortation, "On with the Dance," and there being no more speaking beyond the vote of thanks to the chair, the company took the floor. A material memento of the occasion was provided by the presentation to Sir StClair Thomson of a massive silver drinking-cup.

## OBJECTS RESEMBLING SPIROCHÆTES.

SINCE the discovery of the spirochæte as an agent of disease, and coincident with the extension of its importance in medicine from a very restricted to a wider and expanding field, mistakes have over and over again occurred from the technical difficulties in studying these organisms and in their demonstration and culture. In staining, many of them—most notoriously that of syphilis—have so little affinity for dyes that their tinctorial demonstration in tissues is impossible, and it is only by silver impregnation methods that they can be shown. These methods are uncertain in action, and apt to be complicated by the occurrence of precipitates which obscure observation and may lead into errors, whilst the affinity of certain tissue elements for silver salts may result in the bringing into prominence of fibrils which resemble the spirochæte and have from time to time been erroneously mistaken for them. Culture, the main line of examination pursued by the bacteriologist, is in regard to these organisms laborious and uncertain, so that it is at present rather a hazardous method of research than a helpful procedure in clinical diagnosis. In these straits recourse is widely made to the dark background methods of illumination, which enable the organisms to be seen in their living state and their movements to be studied. This method, which is perhaps the most satisfactory in our existing armamentarium, also has its limitations and its pitfalls. Chief amongst the former is the fact that it can only be applied to materials relatively free of particles other than the organisms. Thus, whilst useful in studying the juice of a chancre or the organisms found in a culture, it cannot be applied to a tissue emulsion. Amongst the latter difficulties is the fact that certain bodies may occur in experiments which, whilst resembling spirochætes, are not these. If blood cells be kept for some time in culture, or other fluid media, long trailing streamers of the envelope material of the red cells appear in connexion with them, and, floating out in the fluid under the influence of molecular impacts, take on movements not unsuggestive of autonomy. During the war a pathologist observing such "streamers" became convinced that in them he had discovered a microbic cause for trench fever and many other conditions as well. In a recent paper [1] Noguchi, who has contributed so much to our knowledge of spirochætes, points out that in impure cultures of these organisms the detached flagella of motile contaminating bacilli may very closely resemble spirochætes, and records that for some time he himself mistook these structures for aberrant forms of *Treponema macrodentium*, with which he happened to be working. Further, many spirochætes develop in cultures well-marked terminal flagella which, becoming separated from the organism, may closely resemble a minute spirochæte. It is well that these sources of error should be recorded, as, since such able and accustomed workers are liable to be misled by them, they are worthy of being given every publicity so that others, who with less experience are working in the fields in which they are met, may be forewarned.

[1] Jour. Amer. Med. Assoc., vol. lxxxvi., No. 15, May 1st, 1926.

## BIRD DROPPINGS.

IN his recent annual report as medical officer of health for the City of London Dr. W. J. Howarth drew attention to the nuisance caused by the increasing number of pigeons, especially in Leadenhall Market, where their excreta contaminate the stalls above which they congregate. Although there is no actual evidence of danger to health there are considerable possibilities of contamination of food, and Dr. Howarth considers that legal powers to reduce the number of pigeons may be desirable. Those engaged in safeguarding the purity of water-supplies have long recognised that the excreta of certain birds may be a cause of contamination of the water-supply and must be kept in mind as a possible explanation of anomalous bacteriological findings. The excreta of pigeons and gulls, and probably many other birds, contain both colon bacilli and streptococci in large numbers and of types which cannot be differentiated from similar organisms derived from human or animal sources. Sir Alexander Houston has pointed out [2] that while the diving gulls (e.g., guillemots) feeding on clean sea water in non-polluted areas do not harbour the colon bacillus in their intestines, the common gulls seasonally forsaking the sea and feeding on all sorts of garbage inland contain this type of organism in their fæcal discharges in enormous numbers. The droppings of gulls frequenting the West Middlesex Waterworks were found to contain at least 1,000,000 typical colon bacilli per gramme. Taking 10 g. of droppings per day it will be appreciated that the resulting *B. coli* contamination of the water-supply, even if it has no immediate epidemiological importance, may interfere seriously with the correct interpretation of bacteriological water tests and obscure the chemical tests by introducing considerable quantities of albuminoid ammonia. These difficulties are most likely to be met with in upland surface water-supplies. Happily there is little evidence of the presence of pathogenic bacilli in the excreta of birds. The only strains known to have been associated with human disease are certain members of the Salmonella group, of which *B. psittacosis* is the most important. This organism has been isolated from parrots and the disease has spread to man. In April, 1892, an extensive outbreak occurred in Paris with 42 known cases involving 14 deaths. Serologically this strain has now been identified with *B. aertrycke*, the bacillus most commonly associated with outbreaks of human food poisoning. Salmonella strains have also been isolated from pigeons and other birds. With our present knowledge it may be said that while contamination from bird droppings must be regarded as a nuisance there is no scientific evidence associating such contamination with disease causation.

[2] Seventeenth Annual Report to the Metropolitan Water Board. 1923.

THE second Victor Horsley Memorial Lecture will be given in the Council Room of the British Medical Association House, Tavistock-square, on Friday, July 9th, at 5 P.M., by Mr. Wilfred Trotter, who has taken as his subject the Insulation of the Nervous System. The chair will be taken by Sir John Bland-Sutton, P.R.C.S. Admission is free to practitioners and students on presentation of a visiting card.

A PLAZA THEATRE BED.—The staff of the Plaza Theatre have endowed a bed in Charing Cross Hospital, and last week a tablet commemorating the event was unveiled by Miss Dorothy Gish. The nucleus of the cost was provided by gratuities for the employees placed by visitors in a box at the theatre.

# Modern Technique in Treatment.

*A Series of Special Articles, contributed by invitation, on the Treatment of Medical and Surgical Conditions.*

## CLXXVI.—THE TREATMENT OF ANÆMIA.

### I. PERNICIOUS ANÆMIA.*

BEFORE undertaking the treatment of a case of pernicious anæmia it is essential to realise what that condition means. Various views obtain regarding the pathology of the disease, but the outstanding fact is that the patient has an insufficient supply of hæmoglobin for his respiratory needs. His tissues lack oxygen. Moreover, the bone-marrow is poisoned and the hæmoglobin which it produces is contained in red corpuscles unduly large, so that the central portion is handicapped as a respiratory agent. The heart is enfeebled. The gastric juice lacks HCl. The kidneys are damaged. The nervous system may be impaired and the tissues offer a very poor resistance and little reaction to infection. A remarkable feature of the disease is the incidence of remissions and relapses. The remissions are often attributed to the last medicine given. It is a curious fact that nearly all cases first come under observation with a red cell count round about 1·2 millions per c.mm. and 30 per cent. of hæmoglobin.

*Rest in Bed.*—Obviously, a patient who has less than one-third of his normal complement of hæmoglobin—and that badly arranged—should be kept in bed. The duration of the stay in bed depends upon progress. In a first attack events move more quickly than in relapses. Death may occur in a few weeks. More likely a remission takes place and in this case every endeavour should be made to persuade the patient to remain in bed till the hæmoglobin percentage reaches 60. He will never again get so good a chance of recovery. In a relapse 60 per cent. may be too high an aim. If hope of its attainment be too long deferred it may be well to allow the patient to get up when the hæmoglobin reading reaches 40. This may become the average reading in patients leading useful if not very active lives.

A patient confined to bed should get as much fresh air and sunlight as may be available.

*Removal of Septic Foci.*—Whether infection acts by poisoning the red corpuscles (excessive hæmolysis) or by poisoning the bone-marrow (deficient hæmogenesis) or merely by lowering the general health, it should be dealt with. Teeth affected by caries or associated with pyorrhœa should be treated as early as possible. The nasal cavities may require attention and any infection of the genital tract should be treated. In initial attacks and in severe relapses one may attempt to alter the intestinal flora by a milk diet for 10 or 14 days, giving an enema daily. β naphthol, gr. x., in cachets may also be given.

*Diet.*—For ten days, or longer if jaundice persists, milk and light farinaceous food only are allowed.

There is sometimes a degree of gastric irritation which makes feeding very difficult. In these cases peptonised milk, whey, or dilute whisky may be tried. After ten days, in the absence of jaundice or gastric derangement, chicken, fish, and custard may be added. Later, ordinary food may be allowed, but the amount of red meat should always be restricted. A little light wine may be given with the midday meal as a stimulant to appetite. An egg-flip containing two teasponfuls of whisky or brandy is a useful "extra."

Meat extracts and soups have a certain use as mild stimulants in acute cases, but they are rich in extractives and for routine use they are better avoided. In my post-mortem experience I have never seen a case of pernicious anæmia with healthy kidneys.

*Gastric Symptoms.*—The diminution or absence of HCl is an indication for its administration. Small doses of the dilute acid may be given after meals. Shaw (*Quart. Jour. Med.*, 1924, p. 319) has suggested the "continuous" administration of HCl by giving it in lemonade, to be sipped during an hour after taking food. Some cases improve, but it is noteworthy that large or even moderate doses are not well borne. In cases of severe vomiting alkaline sedatives are of service. The citrate of bismuth and ammonia, milk of magnesia, and similar preparations are useful. Gastric lavage is too severe a measure for patients desperately ill and morphia is not well borne.

*Arsenic.*—In spite of diversity of view concerning the pathology of the disease and the numerous alleged remedies which have been boomed from time to time, arsenic continues to be the therapeutic mainstay of the overwhelming majority of medical practitioners.

There is a tendency to reduce the large doses which were formerly given. I seldom give more than 5 minims of Fowler's solution thrice daily and find that in this form arsenic is well tolerated; if it be desired to combine arsenic with HCl or iron the liq. arsenici hydrochlor. should be used. It is always well to interrupt arsenical treatment at intervals. After a month it should be dropped for a week. The tongue should be inspected frequently for any sign of irritation or the silvery appearance that indicates that the limit of tolerance is approaching. The onset of sickness or diarrhœa indicates that arsenic should be stopped. Dropsy and œdema may be caused by arsenic and their onset should not be accepted without question as features of the disease. Arsenic also appears capable at times of causing or maintaining a febrile condition.

When even small doses of arsenic set up gastric irritation *intramuscular* or *intravenous* administration may be tried. Fowler's solution (3 to 5 minims well diluted) may be injected into a muscle with the usual precautions to avoid nerves and tendinous attachments. The gluteus maximus one inch below the iliac crest towards the outer side is a useful site. Obviously a patient will not hanker after frequent repetition of this procedure and the physician has to be content with one injection daily. A similar disadvantage is associated with intravenous injection. This method may be preferred to the intramuscular route when the veins are reasonably prominent, but the technical difficulties may be considerable in a very bloodless patient. Three or four minims of liq. sodii arsenatis in 5 to 10 c.cm. of physiological saline solution may be used. The desire to give arsenic in large doses without its unpleasant effects has led to extensive trial of the various organic preparations. Cacodylate of soda, atoxyl, soamin, and others have all been used, but there is no convincing evidence that they confer greater benefit or do less harm than inorganic arsenic. Indeed, they may be more dangerous, since their toxic effects are more insidious in onset and sometimes of greater severity and duration. Herpes, pigmentation, neuritis, blindness, febrile attacks, and gastric disturbance are among the effects of heavy or prolonged dosage, and idiosyncrasy is not infrequent. The salvarsan group has had an abundant trial. Novarsenobillon is probably the least toxic, but its efficacy does not equal that of the inorganic forms. Granted a case in which arsenic is not tolerated by the mouth I would first try N.A.B. and, if possible, I would prefer to give it intravenously rather than intramuscularly. The pain of an intramuscular injection is a factor of some importance in the case of enfeebled patients.

There is no advantage in continuing to give arsenic after the blood count has reached the normal.

*Iron.*—In the average case of pernicious anæmia iron is not only useless, but often causes gastric irritation and headache. It is, however, of service in cases which are in remission. In these cases new red corpuscles may be rejuvenated rapidly and apparently the production of hæmoglobin cannot keep pace with them. The result is that the young corpuscles are poor in hæmoglobin. The criterion of this is the colour-index (the percentage of hæmoglobin divided by the percentage of red corpuscles taking five millions per c.mm. as 100), which should be estimated once a week.

Whenever the colour-index falls below 0·8 iron should be given. I have once or twice seen cases which had been making poor progress begin to improve after the administration of iron although the colour-index was high. This is exceptional, but the expedient may be worth a trial. The form in which iron is given matters little as long as an adequate quantity can be tolerated. Blaud's pill capsules and the tincture of perchloride, well diluted, are among the best.

* An article by DR. GOODALL on the Treatment of Chlorosis and Secondary Anæmia will appear in our next issue.

*Bone-marrow.*—Bone-marrow, red and yellow, raw and cooked, simple and compounded with spleen juice or other product of some irrelevant viscus has often been advocated and remissions following its use have been recorded. I have never been able to associate improvement with the use of bone-marrow.

*Normal Horse Serum.*—When arsenic fails horse serum is worth a trial. It is difficult to understand how it acts, but my favourable experience of it seems to amount to more than coincidence. It may be given hypodermically or even by the mouth in doses of 10 c.cm. When given by the mouth the nature of the substance should not be mentioned to the patient, as the idea of taking the serum may induce nausea.

*Transfusion.*—It is very difficult to assess the value of transfusion. Sometimes an apparently brilliant result is obtained, but the improvement is seldom long maintained. Much more frequently the effect is very slight and often no result may be obvious.

In this connexion I may quote a remarkable case. In 1919 a man, aged 45, complained of weakness and slight jaundice of five weeks' duration. His red corpuscles numbered 1·02 millions; hæmoglobin percentage was 30. He did not improve and it was resolved to try transfusion. His wife's blood was of suitable group and rather over a pint was injected. Almost immediately the patient began to suffer from severe rigors, his temperature rose to 104° F., and the urine became deeply blood-stained. The blood films showed an enormous number of nucleated red cells. After being desperately ill for two days the patient began to improve. He was able to return to work as an electrician and remained well for five years. Weakness and anæmia then returned and advanced rapidly. Transfusion was tried, this time from another donor. There was no untoward result, but no benefit followed and the patient died.

When transfusion is employed the citrate method is the most convenient. Sodium citrate 3·8 per cent. added to blood in the proportion of 1 to 10 prevents coagulation and is isotonic. Transfusion from donors suffering from polycythæmia has often been tried, but while the donor may be benefited there is no advantage over ordinary blood to the recipient.

*Vaccines and Sera.*—These substances are mentioned not from any belief in their efficacy, but because they have been extensively tried and inquiries regarding them are often made. When there is a septic focus which cannot be successfully treated by surgical means, the administration of an autogenous or homologous vaccine is legitimate. It must be remembered, however, that in pernicious anæmia the bone-marrow is so involved in domestic trouble that it has little reserve for dealing with a new stimulus. Since the success of a vaccine depends upon adequacy of reaction, the hope of benefit is but slight. A belief that the source of the causal toxin is the intestine has led to the use of autogenous vaccines made from the fæces. In my experience these are always useless and usually poisonous. Violent reactions may occur, but the patient does not improve. Antistreptococcus serum has been given under the mistaken idea that it meets a causal factor. It is useless and sometimes harmful.

*Splenectomy.*—This operation has no justification either in pathology or in experience. Probably only the more successful cases have been published, and the results of these are less favourable than those obtained by safer methods.

*Complications.*—Many conditions may complicate pernicious anæmia and must be dealt with on their merits. There is no special measure which tends to ward off the nervous conditions, such as combined sclerosis which often follow. It is important not to precipitate them by the excessive use of arsenic. It is worth mention that the pallor and facies of pernicious anæmia sometimes lead to the overlooking of a concomitant condition of hypothyroidism, and even when the latter has not been obvious I have sometimes seen success after a few speculative tablets of thyroid.

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# Special Articles.

## UNIVERSITY OF EDINBURGH.

### OPENING OF THE RECONSTRUCTED DEPARTMENT OF SURGERY.

ONE of the principal events of the Bicentenary Celebration of the Edinburgh Faculty of Medicine is the formal opening of the reconstructed Department of Surgery to be performed by Sir John Gilmour, Secretary for Scotland, on Friday, June 11th. It was in July, 1924, that Prof. D. P. D. Wilkie was appointed to the chair of surgery under what were for Edinburgh new conditions—namely, on a "modified whole-time basis"—on which the professor devotes the major part of his time to his university and hospital duties, but is permitted restricted opportunities for private practice. The medical buildings of the University of Edinburgh were designed and built in the days when the didactic lecture formed the essential part of university education. Whilst extravagantly equipped with splendid auditoria, the building was ill-suited for the practical teaching and research which are the main functions of modern departments in all branches of medicine. Whilst in the departments devoted to the earlier subjects of the medical curriculum—e.g., physiology—well-equipped laboratories had been added, in that of surgery a small museum and a smaller laboratory for histological work were the only facilities available. A complete surgical department must make provision for the carrying out of two main functions—teaching and research. It was decided, therefore, to utilise the existing space, and by reconstruction to provide accommodation for practical and demonstration rooms and for an adequate teaching museum; for a research department a very considerable additional space was required.

#### *Teaching Department.*

The old surgical lecture theatre was large and lofty and was provided with a gallery. By flooring it across at the level of the gallery, an excellent auditorium was provided above and space for practical rooms obtained below. Three practical rooms were thus provided for the teaching of bandaging, surface anatomy, and operative surgery; one of them was fitted out for microscopic demonstrations. A small theatre, formerly used for tutorial classes, was converted into a teaching museum, extra wall space being obtained by building a gallery. The room which formerly served as a museum was fitted out as a students' reading room, in which naked-eye and microscopic specimens, illustrative of the subjects being dealt with in the lectures, could be displayed and studied at leisure. The old laboratories, consisting of three rooms on the ground floor of the building, were converted, one into a room for mounting museum specimens. The second room was turned into a photographic mounting room. The third room was divided into (*a*) a workshop with lathes, &c., (*b*) a chilled room for keeping bodies for the operative surgery class. To provide ready communication between the various parts of the Teaching Department and between it and the Research Department, an electric elevator was installed. In the basement of the building two rooms were equipped for all forms of photography. Wherever possible a clinical photograph and a microphotograph accompany each pathological specimen in all demonstrations. A very complete outfit of apparatus for microphotography, copying, enlarging, reducing, and for the rapid making of lantern slides was set up.

Whilst recognising that in the wards of the hospital the main burden of surgical teaching must be carried out, it is essential that the student should have a thorough grounding in surgical principles in applied anatomy and in surgical pathology. The teaching in the university department is designed to fulfil these objects. The student in his third year of study

attends a course of lectures and demonstrations on the principles of general surgery, and is given practical instruction in bandaging and the treatment of fractures; in his fourth year he returns for a course of lectures and demonstrations in regional surgery and

FIG. 1.

Surgical Research Department, Histological Laboratory.

surgical pathology. For senior students in their final year a special course on surgical pathology is given by the senior assistant in the department, who is the university lecturer on this subject. In his fifth year the student attends a course on operative surgery. This class is divided into sections and the students perform on the cadaver the standard operations of surgery. In the summer session a special course on surgical pathology is held for graduates. In this course the professor and six other lecturers take part, each devoting himself to some subject of which he has made an especial study. This class offers an admirable opportunity to present the latest developments of surgical research and is of value both to teachers and taught.

*Research Department.*

Accommodation for a Department of Experimental Research was obtained by the conversion of a two-storey building adjoining the Teaching Department. This building had been erected three years previously as an Anatomy Department for women students, and consisted of two very large and well-lighted dissecting rooms. By portioning off these rooms into smaller units and equipping them for the various needs of a Research Department, facilities were provided without the erection of a new building. The objects aimed at in the reconstruction of this building were:

(1) Facilities for the routine histological and bacteriological investigation of all pathological material from the clinical unit of the department and for the intensive study of certain material of special scientific interest from other clinical units of the hospital.

(2) The provision of a fully equipped Operating Department with all radiological and recording equipment, where operations could be conducted under conditions equal to, if not superior to, those found in a modern hospital. This part of the department is to be available to workers, not only in the Surgical Department, but also to those in all research laboratories of the University. It is then hoped that a fuller collaboration and liaison may be established between workers in the various branches of medical research.

(3) The provision of accommodation for individual research workers engaged either in experimental research or in the working up of material from clinical cases.

(4) The provision of a common room and library where workers may meet and where informal discussions will be held.

*Ground Floor* (*Plan A*).—On entering the research block we pass from the hall into a room for the reception of all fresh pathological material. This

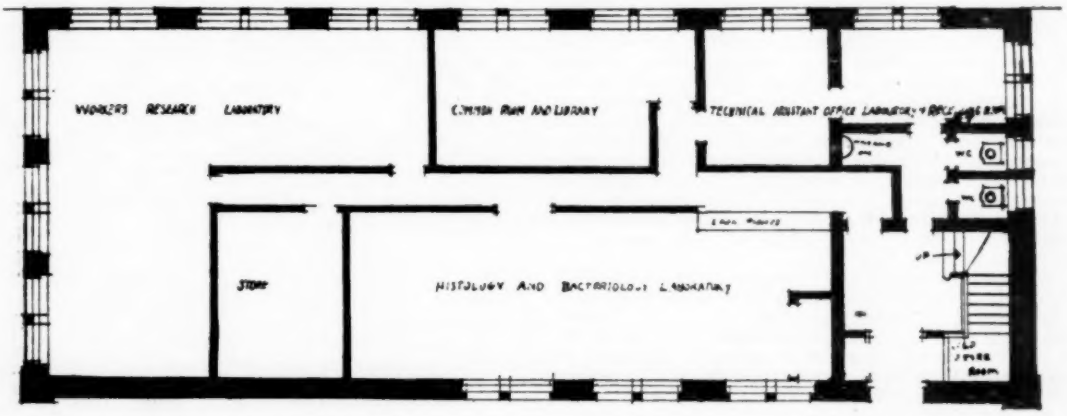
FIG. 2.

Surgical Research Department, one end of large Research Room.

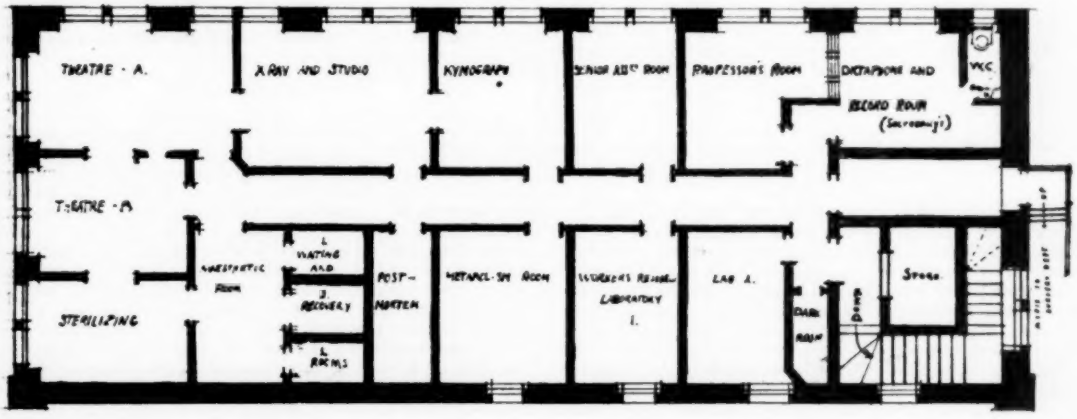
room is provided with a large, shallow sink for the cleansing and assorting of large post-mortem specimens, with a broad bench on which material is indexed and filed by the chief technical assistant, whose room adjoins, before being passed on to the laboratory. On the ground floor is a large laboratory (Fig. 1) in which the technical workers carry out all routine as well as special histological and bacteriological work. It is equipped for all forms of section cutting, including large sections of entire organs. Beyond the technical laboratory is a store room for laboratory materials and special apparatus. Next we enter the *research laboratory* for graduate workers (Fig. 2). It is fitted with benches for 12 workers with cupboard accommodation for each on the opposite wall. Each bench is fitted with a sink with hot and cold water, with electric light and power plugs, with a two-way gas cock, and with an air pressure tap and suction tap. Air pressure and suction are laid on throughout the entire building, the force being generated by motors in the power house. At the ends of this room, which is of L shape, are electric paraffin ovens, incubators, centrifuge and Gerrick pump. In this room the current scientific journals are available and standard works of reference are stored. The workers are encouraged to meet here daily for informal discussions and to exchange views with workers in other department.

*First Floor* (*Plan B*).—On this floor are the private laboratories of the professor and the assistants in the department. Each is fitted with the same equipment as the large laboratory. A kymograph room is equipped with recording apparatus which is of portable type and can be moved to the operating theatres. In direct communication with both the kymograph room and the larger of the two operating theatres is the X ray room. In this is installed the full apparatus for radiography of both the human subject and experimental animals. A small emergency dark room for rapid developing is placed on this floor in close proximity to the X ray room. There are two *operating theatres*, one of which is fitted for radiographic observations during operations. The theatres are floored with rubber; they can be steamed before operation so as to obtain a sterile atmosphere. These are lighted from above and from the sides and artificially by means of daylight lamps placed above a glass false roof. Hot and cold sterile water and saline solution are laid on by pipes from the sterilising room, and in both rooms, below the operating table, is a rubber-covered trap-door concealing a box in which are to be found two electric light plugs, three electric power plugs, an air pressure tap, and a suction tap. By means of a wind-screen wiper the air pressure and the suction can be made intermittent. By partly raising the trap-door leads from these fittings can be brought directly up to the operating table and thus a head lamp, an electric cautery, intratracheal anæsthesia, and suction swabbing of the wound can be utilised without the inconvenience of leads and other apparatus obstructing the theatre. To obviate the collection of dust on the false glass roofs of the theatre, these are made to slope to either side from a central spar along which is led a water sprinkling pipe, by means of which the glass may be washed from above by merely turning a tap. The sterilising room is fitted after the usual hospital pattern with

PLAN A.—*Ground Floor.*




PLAN B.—*First Floor.*



high pressure steam autoclaves, instrument and basin sterilisers, and hot and cold water and saline sterilisers. Adjoining the theatre is the anæsthetic room. Off the anæsthetic room open three specially heated recovery rooms for animals after operation. Besides the protected steam pipes which pass through these rooms, plugs are provided for the supply of electric mats for cases in which the supply of warmth is of special importance. A small post-mortem room completes the operating department, which is floored throughout with rubber and can be flushed with water in its entirety. A biochemical room is equipped for chemical investigation in relation to experimental work and will have a close liaison with the corresponding clinical laboratory in the hospital. A small room, which can be steamed to provide a sterile atmosphere for inoculating culture media and for post-mortem examinations in which bacterial contamination must be rigidly excluded, is found at the entrance to the experimental floor. Adjoining the professor's room on the experimental floor is the dictaphone and stenographer's room, where records of experiments can be made without delay.

*Animal Houses.*—Direct access from the experimental floor is obtained by means of a covered bridge and gangway to the newly constructed animal houses and to the elevator leading to the teaching department. In order to meet the greatly increased demands for experimental animals the animal houses, formerly a collection of one-storey buildings, have been doubled in size by building a second storey. Central heating is provided throughout, the walls are of glazed Keen's cement and can be easily flushed down. The windows and roof lights are of Vita glass to permit of the passage of ultra-violet rays, and next the operating department is a bathroom, fitted for washing animals before operation.

## A VISIT TO SOME OF THE WEST GERMAN SPAS.

OPPORTUNITIES were recently given to representatives of the *British Medical Journal* and THE LANCET to make an official tour of spas in Western Germany, of which little has been heard in this country since 1914. Ten spas were visited, and the brief notes which follow are given in the order in which the visits were paid.

### NEUENAHR.

This little spa is situated in the valley of the river Ahr, a few miles from the point where it joins the left bank of the Rhine, and is reached by train from Cologne in about two and a half hours. It is a well-wooded, sheltered place with clean, smooth gravel paths and roads which make walking possible immediately rain ceases. The Kurhotel, with its 350 rooms, said to be the largest hotel in West Germany, is modern and comfortable, and its kitchens are models of cleanliness and efficiency. Facing the Kurhotel, and separated from it by lawns and gravel paths, stands the Kurhaus (i.e., Casino) with its band-stand, concert-room, theatre, café, dancing hall, and American bar. Here the young and the holiday makers can amuse themselves without disturbing those who are taking the cure. Behind the Kurhaus, and separating the spa grounds from the small town, runs the little river Ahr, which has the appearance of a good fishing water and is said to be well stocked with trout. The spa grounds contain the warm, ferruginous, highly carbonated springs, the discovery of which led to the development of this place some 70 years ago. The bath establishment adjoining the Kurhaus contains 120 bathrooms, mostly constructed for giving only simple immersion baths in the thermal water; there are also rooms for massage, packs, and various electrical treatments, but it is evident that these accessory treatments are of secondary importance.

Neuenahr specialises in the treatment of diabetes and obesity and of sufferers from gastric and duodenal ulcer. Here more attention is given to diet than in most German spas, and in the Kurhotel all menus are divided into three parts; the first the ordinary menu, the second for those with digestive troubles, and the third for the diabetic and obese. The essential features in the diabetic diet are the provision of special breads, biscuits, and puddings with low carbohydrate content but still quite palatable, and the substitution of saccharine for sugar in cooking. The use of the waters is empirical and there is no up-to-date laboratory for clinical investigations. Urinary sugar is estimated, but blood sugars are estimated only in the presence of acetonuria, and, as coma is said to be almost unknown during treatment, it must be assumed that severe cases of diabetes form a small minority of the cases sent here. But with the water drinking and bathing, diet, and graduated exercise it is said that good results are obtained.

The place has an attractive simplicity and shows what can be done in the development of a small spa without lavish expenditure, provided that the local waters and surroundings are suitable.

### EMS.

Ems lies in a deep, rather narrow valley, the configuration of which is reminiscent of Matlock Bath. In the bottom of the valley runs the river Lahn, which is big enough for rowing and sailing regattas to be held here. The town is about equally divided by the river, which is conveniently bridged. Some of the warm springs contain 2 g. of sodium bicarbonate and 1 g. of sodium chloride per litre, this quantity of water yielding from 500 to 600 c.cm. of free carbonic acid gas. The hydrotherapeutic and electrical equipment are modern, and there is a clinic with a State doctor in charge of biochemical and bacteriological laboratories and of the X ray outfit and electrocardiograph. Whilst it is claimed that all catarrhal conditions from eye to bladder benefit by Ems treatment, it is best known for the treatment of bronchitis, asthma, emphysema, and their secondary cardiac disturbances. The pneumatic compression chambers, inhalation, gargling, and spraying rooms are well constructed and provide accommodation for large numbers of patients.

### LANGENSCHWALBACH.

Langenschwalbach may be reached from Ems by car through the forests covering the Taunus mountains. On the hillside are the large barracks built for the French Army of Occupation, which have recently been taken over by the British. The iron drinking waters are used in the treatment of anæmia and dyspepsia. Carbonated chalybeate waters are also used for immersion baths, but best known of all are the chalybeate mud baths, of which some 6000 a year are given for inflammatory conditions of the pelvis, rheumatism, and chronic fibrositic conditions. The rather deserted appearance of this little spa in the hills is probably due in part to a fall in the pre-war number of 6000 visitors per annum to about 2000 at the present time, but it has an attractive and restful look.

### SCHLANGENBAD.

This is a pretty hillside health resort among the woods where the wells are carbonated water of low mineral content. The "steam bath," in which the water flows continuously through the bath, has been found useful for skin diseases; Schlangenbad is a suitable place for rest cures and here come people suffering from insomnia, neurasthenia, and nervous breakdown.

### WIESBADEN.

Wiesbaden lies at the foot of the Taunus Mountains and is a handsome, modern city with beautiful surrounding woodlands. The splendour of the Kurhaus and of the Kaiser Friedrich Bad, completed in 1914 regardless of expense, is somewhat overwhelming. Sodium chloride is the chief mineral constituent of the hot springs, and gout and rheumatism are the complaints for which these waters seem most suitable, but the equipment of the bathing establishments is so complete that practically all

diseases amenable to spa treatment can be dealt with. At the general hospital, of which Dr. Geronne is in charge, there is also a well-equipped balneotherapeutic department. One half of this hospital is at present occupied by the R.A.M.C. as the central hospital for British troops in occupied territory. Several of the private hotels, such as the "Four Seasons," have their own thermal springs and bath houses, so that patients can take their immersion baths with the minimum amount of trouble.

### KISSINGEN.

There is an old-fashioned stateliness about Kissingen and a quiet dignity even in its newest spa buildings which is very restful and in pleasing contrast to the more ornate decoration seen elsewhere. The balneological plant is modern, and experimental work in the collection, analysis, storage, heating, and manipulation of the highly carbonated saline waters is carried out by an able chemist, who is the State mineral water engineer for this and other Bavarian spas. Dr. Granville's letters to the *Times* in 1850, describing the wonders of the newly discovered great artesian salt spring issuing at a temperature of 66° F., may in part account for the large number of English visitors of former times. The cold saline water contains an exceptionally large quantity of free carbonic acid gas. Chalybeate waters and mud baths are used, and the complaints mainly treated are diseases of the digestive system, arterio-sclerosis, gout, and rheumatism.

### NAUHEIM.

Nauheim was well known to English people in pre-war days. The free supply of carbonated saline chalybeate waters issuing at a temperature suitable for bathing without artificial heating or cooling, and in various strengths of saline content and free carbonic acid gas, explains in part why the spa became known as a health resort for people suffering from circulatory disturbances. The mineral water engineering here is particularly interesting. Carbonated saline waters are common in Germany, and other spas claim to give treatment for disorders of the heart as well as Nauheim. The arguments current there as to the absorption or the reverse of carbon dioxide through the skin, as to the different action of artificial and natural $CO_2$, and as to the importance of the proportions of sodium and calcium salts to one another and to other salts are entertaining if not convincing. In Nauheim, however, the dogmatist of the combined auscultation-percussion method, with his gradually diminishing blue-pencilled outlines of the heart, is somewhat curbed by the orthodiagram, electrocardiogram, and galvanometer. The State clinic, where these controls are employed, is under the direction of Prof. Weber, who has further research in view. At one private clinic, run on "Duff House" lines, both investigation and treatment are on up-to-date lines. All forms of heart disease are treated in Nauheim, but renal calculus, chronic Bright's disease, and recent cerebral hæmorrhage are regarded as contra-indications. Whilst the modern spa physician does not claim to reduce the size of the old hypertrophied heart, he does claim to improve functional efficiency in suitable cases.

### WILDUNGEN.

This small spa lies in a little valley surrounded by leagues of hill and forest. There are several springs, the principal one being a carbonated iron water containing little sodium chloride. A large business is done in bottling and exporting the waters which are best known for their action in diseases of the urinary system. Contracted granular kidney, stone, enlarged prostate, cystitis, and the like are treated here, but the large white kidney with marked albuminuria is not considered suitable for these waters. The baths are built in the ground floor of the large Fürstliches Badehotel, where are Turkish baths, douche, and inhalation rooms, although the water, drinking and bathing, are considered the most important parts of the treatment. Ten kilometres away in the River Eder there is excellent trout fishing, at all events for the provident angler who has brought the necessary tackle with him.

### PYRMONT.

Pyrmont is renowned for its mud baths, of which some 300 are given daily, in addition to about 1500 mineral water baths in the full season. They have a high reputation in the treatment of sterility in the female, and it is the custom for young brides from the surrounding country to come here for a course of baths if pregnancy does not result within a reasonable time after marriage. The baths are also used for post-operative and other inflammatory conditions of the abdomen and pelvis. The six chalybeate springs have varying quantities of iron and saline, and one used solely for bathing has a large quantity of carbonic acid. There are also radio-active brine springs besides the enormous quantities of mud, which in this neighbourhood contain sulphuric acid and ammonia. The gardens of Pyrmont are a notable feature, and the presence of palms and other subtropical trees indicates a mild climate.

### OEYNHAUSEN.

This has been termed "the town without steps." The district is flat, and for the convenience of patients taking the cure, and especially those in bath chairs, little slopes take the place of steps wherever possible. The carbonated saline waters come from a depth of 700 metres and the free gas in consequence comes off more slowly than from most other springs. One litre of water yields 900 c.cm. of carbon dioxide. A new spring with a high calcium chloride content is now being bored and is expected to be of value in the treatment of heart diseases. There are also saline baths without carbon dioxide. Diseases of the central nervous system, gout, rheumatism, and circulatory disturbances are all treated here. The newcomer is at once struck by the large number of patients in bath chairs. This is not entirely accounted for by the numbers of paralysed and lame people who come here for treatment, but because the local doctors favour this form of "carriage exercise" as a means of ensuring the requisite number of hours rest for those taking the cure. The town is surrounded by a lovely park with well-kept paths and seats at convenient intervals.

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## PARIS.

(FROM OUR OWN CORRESPONDENTS.)

### *The Witness of Psychopaths.*

AT the recent Congress of Legal Medicine Dr. Rogues de Fursac, medical officer to the Mental Hospital of Ville-Evrard, read an interesting report on the witness of psychopaths, considered both from the point of view of truthfulness and of knowledge; the former being determined by the ratio of exact declarations to the sum of exact and false ones, the latter by the ratio of exact declarations to the total questions asked. Generally speaking, the witness of psychopaths is inferior to that of the sane, but a certain number are found whose coefficient of truth is equal or superior to the lowest coefficient in sane persons. The witness of the psychopath cannot, therefore, a priori be turned down. Provisionally psychopathic states can be graded in regard to fidelity of witness in the following diminishing order: melancholia, chronic delusional psychoses, chronic hallucinatory psychoses, mania, cerebral traumatism, schizophrenia, mental retardation, epilepsy, general paralysis, senile dementia, and cerebral arterio-sclerosis. The extent of knowledge shown by the psychopath is generally very slight, much slighter than its truthfulness. It is manifested in the small number of questions answered rather than in the number of errors committed. Knowledge is generally good for spacial relations and for acts, bad for personal description, colours, words, localisations in time and duration. Psychopaths are very unequally suggestible. From the point of view of suggestibility the author

classes the states in descending series as follows: mental retardation, epilepsy, general paralysis, senile dementia and cerebral arterio-sclerosis, schizophrenia, mania. In melancholia and in chronic hallucinatory psychoses patients are completely refractory to suggestion. The value of a psychopath's witness is always a question of degree and can only be fixed by an expert in credibility.

*A Service of Functional Recuperation at the Salpêtrière.*

Prof. Guillain has communicated to the Academy of Medicine the results obtained at the Neurological Clinic of the Salpêtrière in a service organised there for two years past by Dr. Gabriel Bidou. His method of functional recuperation has nothing in common with the orthopædic method. It implies collaboration of the neurologist with a physiologist who is both something of an engineer and a mechanician. The apparatus required is the result of special mechanical study based on physiological principles and the general laws of mechanics. Knowledge of pulleys, levers, points of rupture and angles of flexion are, for example, all required to put a paralytic on his feet and to give him the means of locomotion. Thus conceived and realised this ensemble of mechanical factors designed for restoring human function constitutes a veritable treatment which adds substantially to the resources of neurological therapeutics. Old paralytics, completely helpless for years, who might have remained all their life at the Salpêtrière have been enabled to leave the hospital and take up some occupation, and in this way the charges on the Assistance Publique have already been substantially lightened. From the medical point of view there is a humanitarian rôle to fill in restoring to family life patients previously condemned to institutional existence.

*Sunday Closure of Pharmacies.*

The Pharmacists' Union has received Governmental support in requiring pharmacists to close on Sundays and public holidays, one pharmacy to remain available in each arrondissement. A number of pharmacists who opposed this ruling and kept their shops open have been heavily fined, and the opposition is weakening. One pharmacist bowed to the inevitable but draped his doorway in black with a representation of a tomb and cross-bones, and an ironic epitaph on the injustice of the legal order.

*Increased Family Premiums.*

Provisions materially increasing the premiums awarded to large families recently became effective. Families counting four children or more, aged less than 13 years each, may receive Fr.360 annually for each child, beginning with the fourth. A family of five children would therefore receive Fr.720, a family of six Fr.1080, and so on. Provisions also extend to widows and widowers. A widow having six children would receive Fr.1800 yearly. The increased premiums are actuated by the desire to encourage repopulation.

Dr. Edmund Landolt, well known for his work on refraction and other branches of ophthalmology, has just died at the age of 79. Born in Switzerland, he became naturalised as a French citizen. His two sons served with the French in the world war. He was occupied with studies on refraction to the very moment of his passing.

A convention, ratified by the Government, will lead shortly to the union of the Institut de Cancer with the Faculté de Médecine of the University of Paris. This move toward centralisation is likely to promote greater efficiency in the measures directed against cancer.

The twenty-sixth French Congress on Urology will open on Oct. 5th under the presidency of Prof. Marion. The chief subject for debate is the Vesico-ureteral Reflex. Information from Mr. O. Pasteau, 13, Avenue de Villars, Paris, 7e.

At the International Dairy Congress being held in association with the *foire de Paris*, or annual Paris fair, it was suggested that milk should be classed according to its food value in terms of fat content and according to the purposes to which the milk is to be put, the price being graded accordingly.

Prof. Sébileau, chief of the oto-rhino-laryngological service of the Lariboisière Hospital, has been presented by his friends, colleagues, and students with a fine bronze medal.

Prof. Prenant's courses in histology, suspended on account of students' demonstrations, have been resumed without further incident.

The municipal institute of electro-radiology in the Boulevard St. Marcel, Paris, planned 12 years ago, progress being interrupted by the war, was inaugurated on May 21st.

A Bill proposing to make tuberculosis notifiable has been sent by the Chamber of Deputies to the Committee on Hygiene for examination.

The centenary of Laënnec's death was at Montfort-l'Amaury celebrated on June 6th. His effigy is to appear on the postage stamps of the antituberculosis crusade.

## BUDAPEST.

(FROM OUR OWN CORRESPONDENT.)

*Unsatisfactory Results with the Dick Test.*

Dr. Jenö Kramár has made extensive experiments in the University Pediatric Clinic in Pécs in the application of the Dick test. His experiences do not seem to corroborate the views of the American authors, who have published enthusiastic reports on the reliability of this test. Dr. Kramár says that those children who were alleged to have suffered from scarlet fever gave positive reactions in practically the same percentage (60 per cent.) as did those who had no history of the infection (58 per cent.). These results could hardly be explained on the basis that the history given might not be reliable. Dr. Kramár found also that serial tests made on the same subject gave different results: the child who gave a negative reaction in the first instance later became positive, and afterwards repeatedly negative. The question arises: Are we justified in regarding a child as immune to scarlet fever because of the negative result of a single test? His experimental results suggest that the reaction in scarlet fever patients does not follow such a strict rule as American authors would have us believe. One-third of the observed scarlet fever patients gave a strongly positive reaction, even in late convalescence; on the other hand, the reaction was negative in other cases even at the outset of the disease on the second and third day. On these grounds Dr. Kramár doubts whether the Dick test could be advantageously used in establishing the diagnosis of scarlet fever.

*Diseases Acquired by Hospital Workers.*

Prof. Dr. Gerlóczy, managing director of the St. Ladislaus Hospital for Infectious Diseases, and lecturer to the Budapest University, publishes interesting and instructive data in the last number of *Egészség* (*Health*). According to the statistical data of St. Ladislaus Hospital during the period 1917 to 1925, out of 176 physicians rendering service as junior, assistant, and senior physicians, 104—that is, 59 per cent.—contracted some infectious disease. Among these there were 33 cases of tonsillitis, 32 influenza (with one fatal case), 5 scarlet fever, 3 typhoid fever, 3 angina, 12 cases of dysentery, 4 epidemic conjunctivitis, 2 nephritis, 2 cellulitis, 2 pleuritis, and 1 diphtheria, 1 erysipelas, and 1 epidemic enteritis. Among the clerks of the hospital 12 contracted diseases and 4 of them died. Among the nurses, 630 contracted infectious diseases, and of these 30 died. Out of the auxiliary staff (servants, laundry women, cooks, &c.), 78 fell ill, with 9 fatalities. The statistics relating to the latter two

categories, nurses and auxiliary staff, cover the period between 1910 and 1925, while those relating to the clerks cover the period commencing with 1918.

*Lottery in Aid of Aged and Incapacitated Physicians.*

The Ministry of Finance has licensed the Association for the Assistance of Incapacitated and Aged Physicians to issue lottery tickets, any profits accruing being allotted to the help of the beneficiaries of the Association. All administrative work will be done by volunteers. Though the Association only called for medical volunteers to offer their services, many lay people of all ranks and classes have volunteered to show their sympathy with indigent doctors. 50,000 lottery notes will be issued at about 6*d.* each, and the management hopes to make a net profit of about a thousand pounds. As the sale of the tickets is likely to be pushed by all doctors, and particularly by those living in the country, it is hoped that the enterprise will be a success.

*The Spread of Goitre in Hungary.*

The Ministry of Public Welfare has compiled statistics on the spread of goitre in Hungary. According to the data published the number of adult goitre patients has not increased. On the other hand, there is a very large increase in goitre among school-children, particularly among girls. The percentage of the occurrence of goitre among school-children is 2·38; that is very low in comparison with certain other lands, as, for instance, Switzerland, where 60–80 per cent. of school-children suffer from goitre, or Austria, where the figure is 25–40 per cent. The institutions established by the Ministry of Welfare for the checking of even this small number of goitre cases appear, judging by the statistics, to be doing good work.

*The Mortality-rate of Budapest.*

In the second half of last year the mortality-rate of Budapest was exceedingly great. In fact, the only capital in Europe which exceeded the Budapest rate is Warsaw. The Hungarian Ministry of Health is greatly concerned about this state of affairs, though the rate is a considerable improvement on that for the corresponding half of 1924. The mortality-rate per 1000 was 17 in Lithuania for the year 1924 and fell to 14·2 in 1925. Since in all other European capitals excepting Oslo the rate of mortality appears to be on the increase, the fact that some improvement is taking place is encouraging.

## INFECTIOUS DISEASE IN ENGLAND AND WALES DURING THE WEEK ENDED MAY 29TH, 1926.

*Notifications.*—The following cases of infectious disease were notified during the week: Small-pox, 193 (last week 162); scarlet fever, 1088; diphtheria, 579; enteric fever, 30; pneumonia, 990; puerperal fever, 45; cerebro-spinal fever, 7; acute poliomyelitis, 3; encephalitis lethargica, 42; trench fever, 1; dysentery, 4; ophthalmia neonatorum, 90. There was no case of cholera, plague, or typhus fever notified during the week.

In London itself there was notified no case of small-pox; scarlet fever, 250; diphtheria, 234; enteric fever, 9; pneumonia, 96; puerperal fever, 6; cerebro-spinal fever, 1; acute poliomyelitis, 1; encephalitis lethargica, 4; and ophthalmia neonatorum, 9.

*Deaths.*—In the aggregate of great towns, including London, there were 1 (1) death from enteric fever, 56 (12) from measles, 6 (2) from scarlet fever, 25 (3) from whooping-cough, 19 (2) from diphtheria, 45 (8) from diarrhœa and enteritis under 2 years, and 78 (15) from influenza. The figures in parentheses are those for London itself.

(The Registrar-General's weekly return had not appeared as we went to press, and we are indebted to the Ministry of Health for these figures.)

THE Minister of Health, Mr. Neville Chamberlain, will distribute prizes at the London Hospital Medical College and Dental School on Monday, June 28th, at 3 P.M. Academic dress will be worn at the distribution, which takes place in the College Library, and there will be tea and music in the garden.

# The Services.

## ROYAL NAVAL MEDICAL SERVICE.

Surg. Comdr. W. T. Haydon is placed on Retd. List with the rank of Surg. Capt.

Surg. Lts. W. H. Bradfield to the *Hermes*, J. C. Souter to the *Emperor of India*, J. W. Tighe to the *Herald*, J. Mitchell and J. C. C. Boyle to the *Defiance*, temp., and A. E. Phillips to the *Dolphin*, for special duties, and to the *President*, addl., for R.N. College, Greenwich, for course of instruction at Medical School.

### ROYAL NAVAL VOLUNTEER RESERVE.

Proby. Surg. Lt. (D) E. D. Collins to be Surg. Lt. (D).

## ROYAL ARMY MEDICAL CORPS.

Maj.-Gen. Sir M. H. G. Fell, late R.A.M.C., to be Deputy Director-General at the War Office, vice Maj.-Gen. C. E. Pollock, K.H.S., who retires on retd. pay.

Maj. and Bt. Lt.-Col. S. L. Pallant to be Lt.-Col., vice Lt.-Col. C. W. Hblden to ret. pay.

Capt. A. G. P. Hardwick retires, receiving a gratuity.

### SUPPLEMENTARY RESERVE OF OFFICERS.

Lt. A. R. Balmain to be Capt.

### MILITIA.

Capts. G. Perkins and I. D. Evans to be Majs.

### TERRITORIAL ARMY.

Lt. G. A. MacDonald (late R.G.A., Spec. Res.) to be Lt.

Lt. E. H. Ponder resigns his commn.

R. W. Power to be Lt.

A. L. Moorby (late Temp. Lt., R.A.M.C.) to be Lt.

Maj.-Gen. R. S. Hannay, C.M.G., D.S.O., late R.A.M.C., has been appointed Hon. Surg. to the King, vice Maj.-Gen. H. A. Hinge, C.B., C.M.G., D.S.O., late R.A.M.C., retd.

## INDIAN MEDICAL SERVICES.

Dr. C. W. Bamford is appointed Resident Assistant Surgeon, Government Headquarters Hospital, and Lecturer in Materia Medica, Medical School, Tanjore, vice Dr. A. P. Kuriyappam. Major P. B. Bharucha, Professor of Anatomy, is appointed Professor of Operative Surgery, King Edward Medical College, Lahore, vice Captain S. N. Hayes, transferred. Dr. Said-Uz-Zafar Khan, Principal, King George's Medical College, Lucknow, has been appointed a Member of the Board of Public Health, United Provinces, vice Major H. Stott, O.B.E., resigned. Captain H. C. Tait, from Quetta, has been appointed Officer Commanding, Indian Station Hospital at Nasirabad, vice Major H. de S. B. Herrick. Major H. Hingston acts as Professor of Medicine, Calcutta Medical College, during the absence on leave of Lieut.-Colonel F. A. F. Barnardo. Major E. H. V. Hodge, Surgeon to the Governor of Bengal, acts as Professor of Clinical Medicine, Calcutta Medical College. Lieut.-Colonel A. H. Proctor, Civil Surgeon, Darjeeling, acts as Surgeon to the Governor of Bengal. Dr. B. B. Brahmachari, officiating Director of Bengal Public Health Laboratory, acts as Professor of Hygiene in the Calcutta School of Tropical Medicine, vice Lieut.-Colonel E. B. Fry. Major A. A. C. McNeill officiates as Deputy Assistant Director of Medical Services (Mobilisation) Rawalpindi District, vice Major A. Kennedy. Captain P. H. S. Smith officiates as Deputy Assistant Director of Medical Services (Embarkation) at Bombay, vice Major C. T. V. Benson. Captains J. Dunlop and R. A. Murphy, Auxiliary Force Medical Corps, have been awarded the Indian Volunteer Long Service Medal.

The following have been granted leave: Major D. Sandes, Professor of Clinical Medicine, Medical College, Calcutta; Lieut.-Colonel E. Waters, Surgeon Superintendent, Presidency General Hospital, Calcutta; Dr. R. S. Keelan, Deputy Superintendent, Mental Hospital, Agra; and Dr. S. H. Commissariat, Superintendent, Medical Aid for Women, United Provinces.

## TERRITORIAL ARMY AMBULANCE CHALLENGE SHIELD.

The annual competition for the Territorial Army Ambulance Challenge Shield will take place at the Duke of York's Headquarters, Chelsea, on Saturday, June 26th, at 2 P.M. The competition is open to squads of Territorial Army medical units and of recognised stretcher-bearers borne on the establishment of other units of the Territorial Army.

# Correspondence.

"Audi alteram partem."

## THYROID ENLARGEMENT AND THE "LACK OF IODINE" THEORY.

*To the Editor of* THE LANCET.

SIR,—The following facts concerning the incidence of thyroid enlargement among the school-children of Hull, and the absence of iodine from the drinking-water of the city, strongly support the thesis of Sir James Berry in his Hunterian Lecture, published in your issue of Feb. 6th last, that lack of iodine is not the cause of endemic goitre.

In March, 1924, Sir George Newman issued a request to school medical officers that all cases of thyroid enlargement among school-children of the age of 12 years should be recorded, defining the condition by stating that only cases in which the enlargement was visible should be counted, and that measurements need not be taken. From the date of the letter until the end of that year 4103 children of the required age were examined in Hull; and only 14 (0·34 per cent.) showed any enlargement, the percentages for the sexes separately being: boys 0·26, girls 0·43. Among the records of other towns may be noticed Liverpool (situated like Hull on an estuary), the percentages here being: boys 0·33, girls 1·38; among inland towns, Leicester: boys 0·81, girls 2·51; Sheffield: boys 1·0, girls 4·4; while in Bristol the percentages were: boys 4·44 and girls 9·78.

As regard Hull, before any children had been examined, steps were taken by one of us (A. R. T.) to ascertain the proportion of iodine in the city supply water. Numerous methods have been proposed for the determination of minute amounts of the halogens (especially bromine and iodine) in natural waters, but the process of Fresenius is commonly followed.

In this method, a considerable volume of the water (20 litres or more) is evaporated to low bulk, after making distinctly alkaline with sodium carbonate, when the insoluble salts are removed by filtration and washing, leaving a filtrate containing all the soluble halogen salts. This filtrate is again concentrated and poured into three volumes of alcohol of 96 per cent. (weight) strength. Sodium chloride and other undesired salts largely separate out, leaving the bromine- and iodine-containing salts in solution. After standing overnight, the solution is filtered, the alcohol distilled off after making the liquid alkaline with a little caustic potash solution, and the residue diluted with water. 20 c.cm. of carbon disulphide (or chloroform), sufficient dilute sulphuric acid, and 10 drops of a saturated solution of nitrous acid gas in sulphuric acid, are now added, and the mixture well shaken. After the addition of more nitrous acid to ensure liberation of all the iodine present, the carbon disulphide is separated and the aqueous solution extracted twice more with further quantities of carbon disulphide. The mixed carbon disulphide solutions are washed with water till free from acid, and then titrated, after adding sodium bicarbonate solution in excess, with standard thiosulphate solution till the solvent has become colourless.[1] Bromides remain in the aqueous solution. A modification of the above process, stated to be so delicate as to detect quantities of iodine so small as those of the order of $3 \times 10^{-7}$ g., consists in the extraction of the acidified salts of the water, treated as before with sulphuric and nitrous acids, with carbon disulphide or chloroform, finally concentrating the solvent by careful evaporation at a low temperature to about 0·02 c.cm., and determining the strength of the colour left in the drop of solvent. For success with these methods it is essential that large volumes of the water be operated on.

No detectable trace of iodine was obtainable from the deep well chalk water supplied to the city of Hull by working in this way; indeed, it would appear that natural deep well waters from the chalk do not contain any appreciable proportion of bromine or iodine compounds. The last named are generally found in highly saline waters containing much sodium chloride and other chlorides; deep well chalk waters contain only very small amounts of chlorides and other salts, except calcium bicarbonate. There is thus no reason to connect the low incidence in Hull of enlargement of the thyroid gland with any action of iodine contained in the drinking-water. The Hull city supply of water is of great organic purity, crystal clear, and needs no filtration nor other treatment before distribution through the mains. Its hardness is: permanent, 6·5 to 7·5; and temporary, 14·0 to 17·0 parts per 100,000, as determined by the soap test and expressed as $CaCO_3$. It is therefore further evident that excess of dissolved calcium carbonate can scarcely be the effective cause of endemic goitre, though water derived from limestone has been suspected to be so. According to Colonel R. McCarrison, it is the presence of undissolved (suspended) matters in drinking-water that is the cause of this disease, and he quotes an instance of a school in which many cases occurred when the water was drawn from a contaminated source; when an unpolluted supply was obtained no new cases appeared.

The suggestion that sea breezes may carry enough iodine to supply the deficiency in the drinking-water might apply to Hull or Liverpool, but it is negatived by the figures from Bristol. If the lack of iodine theory is disproved, it renders unnecessary the addition of iodine to the drinking-water; persons affected by the disease can then be medicinally treated, the risk of causing hyperthyroidism in susceptible persons will not be incurred, and the considerable expense of treating large quantities of water will be saved.

We are, Sir, yours faithfully,

JAMES W. FRASER, M.D., C.M., M.R.C.S.,
School Medical Officer, Hull.

ARNOLD ROWSBY TANKARD, F.I.C.,
May 31st, 1926. City Analyst, Hull.

[1] See Sutton's Volumetric Analysis, eleventh edition, 1924, p. 235; and Treadwell and Hall, Analytical Chemistry, vol. ii., p. 521, for further details.

## CHOLECYSTOGASTROSTOMY FOR GASTRIC ULCER.

*To the Editor of* THE LANCET.

SIR,—Mr. Braithwaite's suggestion to replace gastro-enterostomy by cholecystogastrostomy in the treatment of gastric ulcer seems to me open to the objection that stomach contents can flow as easily into the gall-bladder as bile into the stomach. He based his operation on the success of the technique of cholecystogastrostomy performed for obstructive jaundice due to pancreatic disease (cancer or fibrosis of head); but here we have a more or less constant positive pressure in the gall-bladder. I would like to suggest to him that a more suitable operation would be on the lines of Roux's gastro-enterostomy, inplanting the distal end of the cut jejunum into the stomach as Roux did, but using the proximal cut end to implant into the stomach as near the ulcer as possible; this would ensure *all* the alkaline digestive juices being sprayed on the ulcer which I believe he mentioned in his article as being possibly desirable. (The pylorus, of course, would be closed.)

That the present gastro-enterostomy operation is not the last word in technique or treatment I quite agree. I have always, until the last one I did, performed it on the lines of Sherren's technique no loop-posterior-vertical. While most of them have done perfectly and have remained well, I nearly lost one and my senior surgeon did lose another from persistent vomiting. My case was saved by entero-enterostomy between the efferent and afferent limbs of the jejunal loop; the other case did not survive the second operation. In both cases the stomach and afferent limbs were distended, discoloured, and boggy. Personally, I think there is much too small a margin of safety in the technique and that obstruction easily occurs from kinking. I believe the so-called paralytic vomiting is always obstructive and that in the cases where this is overcome by lavage, &c., the stomach and jejunum eventually settle down into a position

where the *efferent* limb is unkinked and the stomach is able to pass its contents into the efferent limb.

In the future I am fully determined to do only Roux's operation. It takes longer, but is as far as I can see an absolutely safe kink-proof operation and the one I have done had perfect immediate and after results. While on the subject of gastric ulcer I would like to mention the treatment of perforated gastric ulcer. There seems to be a tendency now to treat perforation by suture and immediate gastro-enterostomy. I cannot believe this to be anything but a pernicious doctrine. First, gastro-enterostomy is a big strain to put on a severely shocked patient and in the most competent and rapid hands will entail an addition of round about 20 minutes to the operation; and, secondly, the end-results of several years of experience as a general practitioner-surgeon do not seem to justify any addition to the technique of burying the ulcer by purse-string suture.

On points like this the G.P.-surgeon may safely say a word. If he cannot quote hundreds of cases yet he has to live with his patients afterwards, and I can definitely say that as long as the perforation can be closed and the ulcer turned in without practically closing the pylorus, the end-results lasting in many cases for years, 15 at least, have been excellent. I have only once had to do a secondary gastro-enterostomy after an operation for perforated gastric ulcer, and my experience is that involution cures the ulcer and the stomach rapidly accommodates itself to the deformity produced by this operation. In the case mentioned suturing produced so much pyloric narrowing that I had to do a gastro-enterostomy a fortnight later.

I am, Sir, yours faithfully,

R. LEONARD LEY,
Assistant Surgeon, Great Yarmouth Hospital.

May 31st, 1926.

## THE TREATMENT OF SCIATICA.

*To the Editor of* THE LANCET.

SIR,—Dr. J. P. Martin in his article in your issue of May 22nd on the treatment of sciatica does not include the local application of ultra-violet rays as one of the methods of treatment for this condition. The method is extremely simple, simpler than any of the methods mentioned, and is free from any danger of burns or shocks. The most convenient lamp for the purpose is the Kromayer (water-cooled mercury vapour) which is applied in contact with the skin. The applications are made over the nerve roots and along the course of the sciatic, giving one–two minutes (a third degree erythema, depending on the age of the lamp), particularly to points which are tender to pressure. Ten such points or more may be treated at one sitting, and others on succeeding days. Compared to galvanism, ionisation, or diathermy, it is much simpler, easier, and more rapid in its effects. One exposure to half-a-dozen areas has in some cases given considerable relief. This method has been used in chronic cases which have been treated by the older methods (including nerve stretching) without benefit for years, with striking results.

I confess it is difficult to find an explanation for the effect of ultra-violet treatment in these cases. It is extremely unlikely that any of the rays penetrate to the sciatic nerve, so any direct action must be excluded. Prof. Dixon has pointed out the similarity between ultra-violet rays and the mustard leaf in the effects on the skin (*Brit. Med. Jour.*, Sept. 19th, 1925). Counter-irritation alone, however, will not explain the results, for some of the cases still bore pigmented areas on their thighs as evidence of previous counter-irritants, which they stated had not given relief. Neither will a functional element serve as adequate explanation in the particular type of cases (pensioners) dealt with. The local analgesic action of ultra-violet rays will not explain the effect in chronic cases where the pain is probably due to adhesions and pressure on nerve-fibres within the sheath.

However, even though no adequate explanation can be given, we are no worse off theoretically than with most of the other methods, for there is no adequate explanation why ionisation, galvanism, or oxygen should give relief. The following are types of case which have been treated with benefit:—

CASE 1.—Admitted for treatment for bronchitis and asthma, but for the last two years had been complaining of a left-sided sciatica. In 1924 he was treated at an infirmary for seven weeks without benefit. He was at home in bed for four months and then treated at another hospital for several months. On admission here in November, 1925, he was walking with a crutch. He was complaining of pain across the loins and could not put his heel to the ground, owing to the pain it caused in the whole limb. Within a week he discarded his crutch, walking with the aid of a stick only, and he soon discarded that too. He was in the hospital for treatment for his bronchitis and asthma for two months. During this period the treatment for sciatica was continued, both local and general ultra-violet baths being given. By the end of the two months he had made up a half inch wasting of the thigh and his sciatica had disappeared.

CASE 2.—Contracted sciatica 1915. He had attacks at intervals till 1920, and since then he has been treated with radiant heat, massage, and electrical methods at one hospital or another every year. He was discharged from one hospital in March, 1925, but was readmitted to another in August. For two months he was on massage, radiant heat, and electrical treatment without benefit. When he came to the "Light" Department in October he was limping along with the help of a stick. He was tender to pressure along the course of the sciatic, and there was half inch wasting of thigh and calf. He also had a marked synovitis of the right knee. Within three weeks he discarded his stick and could walk three miles. Within two months the synovitis had disappeared, and also the wasting of the limb. He had gained 10 lb. weight and was discharged.

Not all cases will respond, but of ten cases, with an average history of seven years, there have only been two failures. One of these was on treatment for a short period, but as he was showing no signs of improvement, the nerve was stretched by the open method with considerable success, a previous manipulation having failed to give him relief. The other case also had the nerve stretched after a period of ultra-violet treatment without benefit. It should be added that all these cases were also given general ultra-violet radiation as a general tonic. I feel, however, that the effect was mainly due to the local treatment, as the symptoms disappeared in some of the cases before the general baths could have had an appreciable effect.

I am, Sir, yours faithfully,

M. WEINBREN.

The Queen's Hospital, Frognal, Sidcup, Kent.
June 2nd, 1926.

## FILIGREE IN HERNIA OPERATIONS.

*To the Editor of* THE LANCET.

SIR,—The article by Mr. Percival P. Cole in THE LANCET of May 22nd must compel attention to the use of the filigree in the operation for the radical cure of inguinal hernia. His figures are so convincing that they cannot be disregarded by those interested in the problems of hernia. They should silence once and for all the unfair criticisms levelled against the method in text-books of surgery and in monographs on hernia—criticisms not infrequently repeated by those who have not given the method a fair trial nor mastered the technique of the operation. Such results should embolden those who are restrained from the use of the filigree because of theoretical objections. Not uncommonly does theory mislead or misdirect us in the practice of surgery. It is regrettable that so simple, so effective, and so successful a method should not be more commonly practised.

The published results of hernia operations with their usual 6 to 8 per cent. recurrence in oblique inguinal hernia and very much larger, one might say appalling, recurrence rate in the direct variety are based on cases selected for operation after numbers have been rejected as unsuitable either from the point of view of age, size, type, or duration of hernia. Mr. Cole has drawn his series from the same source

as that from which I quote cases below—viz., seamen, of whom none are refused operation. There is no selection. A hernia even controlled by truss prohibits a seaman from going to sea and therefore endangers his livelihood, so that operation cannot be refused. This fact adds immense weight to Mr. Cole's results as they stand, and in comparison with other reported series, and makes the filigree properly used almost indispensable in certain cases.

I find that in the last three years at the Seamen's Hospital—and I only quote these cases, although I have used the filigree elsewhere, and in my private work—that I have operated on 121 cases of hernia and in 28 have used filigrees. The filigrees were employed in recurrent inguinal hernia, direct inguinal hernia, and large oblique inguinal hernia of long standing in aged persons with but scanty musculature —cases, indeed, in which one has learnt by experience that high ligation of the sac alone or in combination with some form of plastic suturing would be insufficient. It is only natural that seamen would return to their hospital, which has a world-wide reputation amongst them for the treatment of hernia, if trouble followed the use of the filigree or if there were recurrence. In the last five years there has not been a single return for removal of the filigree for any cause, or for recurrence in a case where filigrees have been used.

I am, Sir, yours faithfully,

London, W., June 1st, 1926. E. T. C. MILLIGAN.

## LISTERISM IN MIDWIFERY.

*To the Editor of* THE LANCET.

SIR,—To the obituary notice of Sir John Williams in your last issue I should like just to add that he and I set up Listerian antiseptic midwifery at the General Lying-in Hospital in 1880—the first lying-in hospital in England to adopt Listerism. This is a piece of history which should not be lost.

I am, Sir, yours faithfully,

Uckfield, Sussex, June 4th, 1926. F. H. CHAMPNEYS.

## AUTOLYTIC PRODUCTS AND MALIGNANT TUMOURS.

*To the Editor of* THE LANCET.

SIR,—In Dr. Gye's communication to the Surgical Section of the Royal Society of Medicine, reported in your last issue, and also in his original paper on the origin of tumours, he fails to call attention to a fact which has been known for many years—viz., that the autolytic products of tumour tissue contain substances which are stimulating to the growth of tumour cells. These substances are certainly chemical bodies and not living agents, they act in high dilution, and they are in all probability end-cleavage products of enzyme action. We have reason to suppose that they are present in other tissues than malignant tumours, such as embryo tissue, mammary tissue, and placenta, in fact in all tissues rich in nuclear structures. Stimulation of growth with embryo tissues was obtained as long ago as 1910 by Haaland and others.

It is evidently of great importance in proving Dr. Gye's argument that the tests he has carried out on his control tubes containing autolysed embryo tissue are completely reliable. Dr. Murphy and he disagree on this point. When two entirely conscientious experimenters differ in the results they obtain with a particular group of experiments it usually means that both are recording true results, and I should hesitate to disbelieve Dr. Murphy's positive findings notwithstanding Dr. Gye's 150 experiments with negative findings. The explanation is, very probably, that some slight but important difference of technique has occurred. In test-tubes containing autolysing tissue the contents of the tubes are constantly changing and are changing in different degrees in different parts of the same tube. I should expect to find growth stimulants at the bottom of the tubes but not necessarily in the upper fluid. If one observer has stirred his tubes and the other has not, different results might easily be obtained. Dr. Gye acknowledges that his Rous virus may not be actually killed in the chloroformed extracts. It seems therefore that he is really studying the factors which can revive an attenuated Rous virus rather than the "origin of tumours."

Dr. Gye has undoubtedly done a great service to research and I do not question the facts he has observed, only the interpretation he has put upon them. To the researcher there is no problem more open to pitfalls or more difficult than the true interpretation of results.

I am, Sir, yours faithfully,

Watford, June 3rd, 1926. HELEN CHAMBERS.

## BIRTH INJURIES TO THE EYE.

*To the Editor of* THE LANCET.

SIR,—In your annotation with this title, published in THE LANCET of June 5th, you say, in referring to the corneal scars left after rupture of the posterior elastic lamina: "These scars are always vertical, or approximately so, a fact probably related to the direction of pressure by the forceps." You will, we feel sure, allow us to mention that this is not a strictly accurate statement. A reference to our article, Obstetric Injuries of the Cornea, in the *Ophthalmoscope* for 1905, and on p. 271, will show that out of ten cases there shown in diagram, the opacity was transverse in one and concentric with the corneal limbus in another. Further, on the supplement page which faces p. 267, there is an actual drawing of the transverse case. It is true that the scars are usually more or less vertical, but we are of opinion that they may occur in almost any direction.

We are, Sir, yours faithfully,

Stirling, June 8th, 1926. ERNEST THOMSON.
Glasgow, June 8th, 1926. LESLIE BUCHANAN.

COMPLIMENTARY DINNER TO PROF. FIBIGER.—The medical staff of the Cancer Hospital (Fulham-road, London) gave a dinner at the Langham Hotel on June 7th to Prof. Johannes Fibiger, of Copenhagen, in recognition of his eminent services to cancer research. The chair was taken by Mr. Ernest Miles, senior surgeon to the hospital, and among those present were Lord Dawson, Sir Humphry Rolleston, Sir John Bland-Sutton, Sir Frederick Andrewes, Sir Walter Fletcher, Profs. Muir, Bulloch, Dreyer, Dean, Ledingham, and Lazarus Barlow, Dr. H. H. Dale, Dr. W. E. Gye, Sir James Dundas-Grant, Mr. Cecil Rowntree, Mr. Percival Cole, Mr. Cecil Joll, Mr. C. E. Shattock, Dr. Stanley Wyard, Dr. H. Robinson, Dr. E. L. Kennaway, Dr. H. J. B. Fry, Dr. J. O. Harvey, Dr. J. E. A. Lynham, Dr. R. Knox, Dr. W. Cramer, Mr. L. A. Harwood, Dr. Archibald Leitch, and Mr. A. L. Abel.

PROF. G. M. ROBERTSON ON LUNACY CERTIFICATION. At a lecture given under the auspices of the Edinburgh branch of the British Medical Association on June 1st, Prof. Robertson stated that certification was essentially confidential and personal and that action might easily be taken against a doctor on a patient's release from an asylum or mental hospital, especially as with many patients the recovery was only partial. He urged the necessity of protection by some society. It was usually the second certifying doctor, who did not know the patient so well, who bore the brunt of the action. The provision of the Act was that "reasonable care" should be exercised; if a second visit was paid and careful notes taken, this should satisfy any jury with regard to necessary care. The word "lunatic" being a medico-legal term denoting a person suffering from disease of the mind affecting conduct, a person could not be deprived of liberty unless he was of unsound mind affecting his conduct with regard to the safety of himself or others. The best way out of any difficulty was to persuade the person to enter a mental hospital as a voluntary patient, and this was not so difficult as might be supposed; nowadays, in fact, in the higher paying hospitals, 60 to 80 per cent. entered on this basis, although unfortunately this was not the case to the same extent in parish-controlled hospitals where Government grant was lost unless a patient were certified.

# Obituary.

## SIR WILLIAM BOOG LEISHMAN, K.C.M.G., C.B., M.B., C.M. GLASG., F.R.C.P. LOND., F.R.S., LL.D.,

DIRECTOR-GENERAL, A.M.S.

NOT only the medical profession but the whole scientific world learned with real grief the death last week, after a brief illness, of Sir William Leishman, Director-General of the Army Medical Service for the past three years. He belonged to a select and extraordinarily able band of men who during the first quarter of this century have revolutionised the whole outlook of tropical medicine, and within that band

SIR WILLIAM LEISHMAN.

he specially distinguished himself by his large and independent researches, while contributing with untiring and unselfish effort to the general output.

William Boog Leishman was born in 1865, the son of Dr. William Leishman, professor of midwifery and obstetrics in the University of Glasgow. He was educated at Westminster School, and entered the medical profession as a student at his father's university, where he graduated M.B., C.M. in 1886. He joined the R.A.M.C. the following year, holding his first commission, therefore, at the age of 22. He proceeded on foreign duty in 1890, and first saw active service with the Waziristan expedition in 1894, where he obtained the medal and clasp. By this time he had already begun to take a close interest in bacteriology, especially in relation to the tropical diseases malaria and dysentery, with which he found himself in perpetual contact. On return to England in 1897 he was stationed at Netley, where he did duty in the wards, but spent all his spare time in the excellent laboratories of the Army Medical School under Sir Almroth Wright and Sir David Semple, then respectively professor and assistant professor of pathology. During this period he assisted Wright in the early work on typhoid vaccine and made some investigations into Malta fever, a disease which later he contracted himself in the laboratory. He also took part in the teaching and demonstrating in the classes for surgeons on probation, and did this so well and showed such aptitude that he was appointed assistant professor in 1900 when Semple went to India. We learn from Sir Almroth Wright that on his arrival at Netley it was significant that he seemed not to know his own splendid capacities for research. Wright had launched between the years 1897 and 1900 his great antityphoid work, and was proceeding with researches in vaccine therapy. These were impeded because the bactericidal power of the serum did not give the necessary indications, and Leishman invented the method of testing the phagocytic power in vitro with resulting developments. At that time at Netley leucocytes were being stained by the cumbrous method which goes by the name of Romanovsky, and Leishman introduced his stain, which has now quite superseded its predecessor. Romanovsky had used mixed solutions of methylene-blue and eosin, and Leishman had the inspiration to mix these together to filter off the precipitate and to dissolve it in methyl alcohol, a solvent used by Jenner in making his stain. These things are mentioned to show how well there were combined in Leishman the ability to devise and acquire technique with the large views later to result in great ends.

At Netley, while still associated with Wright, the beginning was made of the discoveries which led to Leishman's early recognition as a pioneer in tropical medicine. He showed Wright some preparations which he had stained and which had been taken from the spleen after a post-mortem on a man who had died of "dum dum fever," as it was then called. The whole field of the microscope was thickly sown with small oval bodies corresponding with nothing that Wright or he had ever seen or read of—what are now known as leishmania parasites—and Leishman, who was a most excellent artist, made some drawings and kept the matter in his mind. Later, when the Royal Army Medical School had moved to London, the work being done at what was then the laboratory of the Conjoint Board, Leishman noticed formed elements when looking at specimens derived from animals who had died with the trypanosomes recently discovered by Bruce and found in rats infected with nagana. These put him in mind of the organisms which had completely puzzled both him and Wright, and he worked on the theory that the organisms which he had previously observed were stages in the life-history of a protozoon, a view which was later confirmed in Calcutta by Rogers, who proved that these bodies, when introduced into a suitable medium, are converted into a flagellate resembling the trypanosome, thus substantiating Leishman's original view of the parasite.

That Leishman was not the first to see the parasites is now admitted. Cunningham, in 1885, described peculiar parasitic organisms in "Delhi boil," and considered that the bodies were a form of spore. In 1891 Firth appears to have seen similar bodies, but thought they were sporozoa. After Leishman's discovery, speculations were rife as to the nature of the bodies; Laveran and Mesnil suggested that they were piroplasms, but Ross, like Firth, thought that they were sporozoa, and afforded them the dignity of genus by the title of "leishmania." This adaptation of Leishman's name has, in time, come to be applied to the whole group of diseases now known as "leishmaniasis." In 1903 Donovan in India recorded parasites similar to those described by Leishman in the tissue of patients dying of kala-azar, after which the organism, therefore, came to be known as the Leishman-Donovan body. And in the same year J. H. Wright, confirming Cunningham, saw bodies in an oriental sore which later became known as the parasite of oriental sore, or "Delhi boil" as it is sometimes called, and has been scientifically termed "Leishmania tropica." In 1904 came Rogers's substantiation of Leishman's original view as to the parasite. The group of diseases is now much expanded. Similar parasites were found in sores in Brazil by Lindenburg, Carini, and Paranhos in 1909; Splendore and Carini showed that the peculiar ulceration of the pharynx and nares in South America, commonly known as bubas, was also leishmaniasis. It is now known that kala-azar has almost a world-wide distribution; it has been found in Central Africa and Northern China,

while a similar disease is very common in the Aegean Islands and the Mediterranean area, where it attacks both children and dogs. The disease group which bears Leishman's name is, therefore, of high economic importance, as one of the most widespread scourges which afflict mankind.

From 1905 onwards Leishman devoted much of his time to the observation of pathogenic spirochætes, especially *Treponema pallidum* and the allied parasites of yaws and relapsing fever. His early investigations were concerned with the morphology of these spirochætes and the relation which might exist between European and African forms, but he found it was impossible to substantiate any morphological differences. He expended great labour in attempting to cultivate these organisms in artificial media, and observed in so doing the peculiar agglutination of the spirochæte. His experiments were afterwards directed towards the changes undergone by the spirochætes in the tick's body, and the manner in which hereditary transmission takes place in the arthropod. He found it impossible to trace the spirochætes in the body of a tick later than the tenth day after feeding, and his researches on the eggs laid by infected ticks were negative. While these experiments were in progress he was struck by the frequent occurrence of clumps of granules in various parts of the tick's body which he suspected as being of parasitic nature, and which he continued to regard as stages of the development of the spirochæte; and later, when the advantage of the dark-ground illumination method came in he was able to satisfy himself that young spirochætes actually developed from these granules. His researches on this subject were made the subject of a summary in the Horace Dobell lecture delivered before the Royal College of Physicians of London in 1920. Much of this work has been confirmed by Nicolle and his colleagues in their observations upon the development of the spirochæte in the louse, in which gradually the organisms appear to undergo a life-history similar to that described by Leishman.

To go back in the tale, in 1903 Leishman succeeded Wright as Professor of Pathology in the Royal Army Medical College when, in addition to discharging the arduous duties of the post with the spirit which bore splendid fruit during the whole ten years of his office, he carried out a scheme in respect of anti-typhoid inoculation which had been already devised by Wright and himself. This was to inoculate a series of groups of men with different doses of typhoid vaccine, afterwards measuring their immunisation curves with a view to selecting the optimum dose of vaccine, which was thus fixed at 1000 millions for the first dose. The work which Leishman did in the introduction of vaccine and inoculation against typhoid fever constitutes his most important contribution to medicine, far-reaching as the other discoveries have been or may be. This method had already been tried during the South African War, but the reaction that it produced, and the ill-health which resulted from the inoculation as then prepared, was too severe, allowing a certain class of critic to insist that the cure was worse than the disease. But from 1902 onwards, Leishman, in association with Wright, busied himself in the preparation of a less potent preparation. The early experiments were summarised in the Harben lecture for 1910, and published in the *Journal* of the Royal Institute of Public Health and are familiar to all. The original ravages of enteric fever in India amongst the British garrisons, where it was especially prevalent, were taken into account as well as the lessons of the South African War, when there were no less than 57,600 cases of enteric fever with over 8000 deaths. To the subsequent intensive study we owe the preparation of the typhoid vaccine which was used with such success in the recent war, a success mainly lying in the observations of the growth of the organism and in the details of the technique of sterilisation. The result achieved is now universally recognised and the lessons have been published widely. They were well set out by Leishman himself in a paper entitled "Enteric Fevers in the British Expeditionary Force of 1914–1918" and published in the *Glasgow Medical Journal* in 1921. From this paper we learn that he first decided that the best protection could be obtained by the initial test of 500 million organisms, followed a week or so later by one double that amount. The immediate returns appeared to be unfavourable to the continuance of this method, but it was ascertained that the increase of cases was due to the paratyphoid organisms, and when these were added to the vaccine almost complete protection was produced—a striking vindication of Leishman's work. As the result of the inoculation of the vaccine there was secured for our men a considerable measure of protection against the paratyphoid infection as well as against typhoid, though the immunity produced against the former was not of such a high degree as against the latter. We may quote the remarkable figures. In 115, in the strength of over 600,000 troops there were only 570 cases of enteric fever notified with 34 deaths; a striking comparison with the figures of 14 years previously in South Africa.

While all this original work was in process Leishman was winning a wonderful name for himself, for he developed powers of teaching which a large number of officers can testify proved to be of the highest value to them. Many we know would speak with real gratitude of the good derived from his instruction and guidance. He was a most patient and painstaking instructor—nothing here seemed a trouble to him that would assist in explaining a point or clearing up a difficulty; he was an able and even brilliant lecturer, and it is no wonder that his work should have borne the fruit that it did.

At the outbreak of war Leishman, officially described as Expert in Tropical Diseases on the Army Medical Advisory Board, was directed to join the Expeditionary Force on Oct. 3rd, 1914, and was attached in an advisory capacity to the staff of the D.M.S. of the Force. A few months later the designation of "Adviser in Pathology" was attached to the post. The following list will give some idea of the different lines of work which had devolved on him by the year 1917: 1. Adviser in pathology to the Expeditionary Force. 2. Member of the Advisory Board of the Director-General, Medical Services, G.H.Q. 3. Chairman of research committees on trench fever and on nephritis. 4. Inspection of all mobile and hospital laboratories, at the front and on the lines of communication. 5. Coördination of the work done in the laboratories. 6. Recommendations on appointments to the charge of laboratories. 7. Advice on the installation and equipment of new laboratories. 8. Distribution of laboratories and pathologists to meet local emergencies. 9. Advice to medical store department on laboratory equipment, reagents, apparatus, &c. 10. Advice on all matters relating to the supply and employment of sera and vaccines. 11. Advice on tropical and parasitic diseases in native troops and labour contingents. 12. Collaboration with the A.D.M.S. (Sanitation) in the control of infectious disease. 13. Collection and analysis of returns relating to enteric fever and tetanus. 14. Reports to the D.G.M.S., G.H.Q., and to the D.G.A.M.S., War Office. 15. Arrangements for the collection of pathological specimens. 16. Member of the Inter-Allied Sanitary Commission, Paris. 17. Member of the Inter-Allied Surgical Conference, Paris. 18. Liaison with the pathological work of the armies of the Allies. Even this list is not exhaustive; it is set out to show the multifarious and important responsibilities which had accrued to him by the time the critical later stages of the war were reached; that he should have fulfilled them satisfactorily makes a splendid record of service, and that he should have been instructed to undertake them proves what the estimate of him was in the highest places.

When the Directorates of Pathology and Hygiene were formed at the War Office in 1919, Sir William Leishman was appointed Director of Pathology and

remained in that appointment until 1923. During those four years his activities were far-reaching, and his work established the newly formed directorate on a solid and enduring foundation. His advice and support to the then Director-General on matters concerned with pathological science were of extreme value, as Sir John Goodwin has testified, both to his official chief and to the Army generally. In 1923 he was appointed to be Director-General of Army Medical Services at the War Office, an onerous post, the duties of which he was performing with the greatest distinction and ability when he was cut off in the midst of his work, and just when so many of the problems and projects in which he was engaged bore promise of ampler fruition. While many regretted the necessary break constituted in a brilliant scientific career by the call to become Director-General, there were at least as many who recognised that Leishman's right to be the head of the Service was so incontestable that any other appointment would have been open to criticism, while it was certain that he would bring to that position the qualities which he had already displayed in scientific and official fields, to the great benefit of an organisation to which he was devoted.

Outside the Army Medical Service Leishman's appointments and responsibilities were also great and various. He was a member of the Yellow Fever Commission, West Africa (1913–15), and of the Medical and Sanitary Advisory Committee for Tropical Africa at the Colonial Office; he was for ten years a member of the Medical Research Council, vacating his seat on appointment as Director-General; he was a member of the Scientific Advisory Committee of the British Empire Cancer Campaign; quite recently he was appointed chairman of the Foot-and-Mouth Disease Research Committee of the Ministry of Agriculture; he was a past President of the Society of Tropical Medicine and Hygiene and had acted as examiner in pathology at Oxford and in tropical medicine at Cambridge. Just before his death he was elected President of the Section of Comparative Medicine at the Royal Society of Medicine, an appointment which shows alike that the wide range of his learning was appreciated by colleagues, and that his own desire was keen to remain actively associated with scientific work as far as the duties of his high official post would permit him to do so. His contributions to medical and scientific literature were numerous and particularly instructive as being personal records. These papers will be found in THE LANCET, *British Medical Journal*, the *Journal of Tropical Medicine and Hygiene*, the *Journal of the Royal Army Medical Corps*, the *Glasgow Medical Journal*, the *Journal of the Royal Institute of Public Health*, as well as in the Transactions of the Royal Society, while he also wrote the article on kala-azar in Allbutt and Rolleston's "System of Medicine."

In 1910 Leishman was elected a Fellow of the Royal Society, and served for two years as Vice-President. He was knighted in 1909, and in 1912, having just been promoted Colonel, he was appointed honorary physician to the King. He was created C.B. in 1915, K.C.M.G. in 1918, and K.C.B. in 1924, and was continually mentioned in dispatches during the European War; he was a Companion of the Legion of Honour and held the Distinguished Service Medal of the United States Army.

The story thus set out indicates a life that was lived to the extreme limits of intellectual ability and physical capacity, but it remains to add that the brilliant researcher and competent official was the simplest of men, transacting his duties with no evidence of strain and bearing his honours without a trace of manner. As far as possible, he seemed to efface himself, his courtesy was clearly genuine, his personal kindness can be testified to by a large series of contemporaries and juniors, and his generosity to fellow workers was unfailing. His premature death after a brief illness was a real grief to friends, colleagues, and a big and various public.

Sir William Leishman married, in 1902, Maud, eldest daughter of the late Colonel E. Gunter, by whom he had one son and three daughters, to whom all sympathy in their loss will be extended. The funeral service was held in the Chapel at the Military Hospital, Millbank, conducted by the Rev. A. C. E. Jarvis, Chaplain-General to the Forces, assisted by the Rev. C. Thacker, Chaplain to the Hospital, and the Rev. P. McCormick, the Westminster Abbey choir attending. The King and the Queen were represented at the impressive service, as were the numerous public bodies in whose conduct Sir William Leishman had played so prominent a part. The pall-bearers were drawn from the heads of the medical services of the Navy, Army, and Air Force, and a guard of honour with regimental band was provided by the Grenadier Guards, the route being also lined by officers of the R.A.M.C. and nursing sisters. The funeral was conducted privately at Highgate.

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## SIR STEWART STOCKMAN, M.R.C.V.S.

BY the death of Sir Stewart Stockman veterinary science has suffered a severe loss. His name will be permanently associated with the courageous stand to eradicate from this country the menace of foot-and-mouth disease. He had the strength of character to press his professional convictions into effective execution in spite of much adverse clamour, and in so doing gained the confidence of the Government department he served, of the veterinary profession, and, still more important, of the farming community which came to regard him as a wise and trusted counsellor.

Born in 1869, the fourth son of the late Mr. W. J. Stockman, merchant, of Edinburgh and Leith, he received his early education at the Edinburgh High School and his veterinary training at the Royal (Dick) Veterinary College, Edinburgh, from which he qualified as member of the Royal College of Veterinary Surgeons in 1890. Subsequently he studied abroad, chiefly at the École Nationale Vétérinaire, Alfort, Paris, and then occupied the posts successively of demonstrator of pathology and professor of pathology at the Royal (Dick) Veterinary College, Edinburgh. In the course of these years he came into intimate contact with the masters of comparative pathology—Nocard, in France, and McFadyean, in England. He resigned his teaching appointment in 1900 to serve in the South African War, and after the termination of the war accepted a post in the Indian Civil Veterinary Department. He was among the first batch of civilian veterinary surgeons to occupy posts in this department, and his stay in India—an ideal training-ground for the epizoölogist—though brief, gave him opportunity to demonstrate his capacities; his work on cattle plague (rinderpest) ranks as a real contribution to knowledge among a mass of misleading information based on faulty field observation. He was then selected for appointment as principal veterinary officer to the Transvaal, in which capacity he served for three years. His South African experience, though again short, was eventful. In 1896 cattle plague had spread southwards, causing terrible havoc among the cattle population of South Africa and depriving the inhabitants of their main means of support. Later alarming new epizoötics appeared, notably the piroplasmoses ("redwater") and East Coast fever. With the brilliant collaboration of Sir Arnold Theiler, then veterinary research officer to the Transvaal, the rationale of control was elucidated, and Stockman realised its execution by introducing a system of veterinary police control which still remains.

In 1905 Stockman was appointed chief veterinary officer to the Board (now the Ministry) of Agriculture and Fisheries, to administer the Diseases of Animals Acts. At the time of his appointment there was hardly any research work executed by the veterinary department of the Board. Stockman's activities lay in two directions—first, in the organisation of a field service composed wholly of qualified men, and, secondly, in

the establishment of a properly staffed and equipped research section. With the hearty support of Mr. Walter Runciman there was erected, near Weybridge, a first-class laboratory—the first institute in the United Kingdom for research into prevalent animal diseases. Under the able direction of Stockman, who was appointed director of veterinary research to the Ministry, a series of valuable researches was carried out, all with direct bearing upon the problems of animal husbandry. Even before adequate laboratory facilities were forthcoming a piece of work on bovine epizoötic abortion was performed in collaboration with Sir John McFadyean. Since then "redwater" and other diseases of cattle, scrapie and louping-ill of sheep, swine fever, certain diseases of poultry have been studied, and, at the present time, experimental work upon a large scale is being carried out upon the nature of the foot-and-mouth virus.

Although in the course of his lifetime Stockman attained international repute as an experimentalist and a shrewd and conservative observer in researches into animal disease it is as an epizoölogist, a veterinary Gorgas, that he will chiefly be remembered. He worked without ceasing to free British livestock from the incursions of contagious disease, and succeeded to a degree unknown in other countries; witness the work done under his direction to suppress rabies, to eliminate glanders, to mitigate the ravages of swine fever by means acceptable to the agriculturist, and to bring about the dwindling incidence of sheep scab. His efforts to prevent foot-and-mouth disease from becoming an ever-imminent danger to the existence of our herds told heavily upon his physical health in recent years. He had just returned from a tour in the Argentine, undertaken for the purpose of investigating there the conditions of the meat trade with this country. The state of his health prevented taking up further duties on his return, and he journeyed to Glasgow to obtain advice and treatment from his brother, Prof. Ralph Stockman. He died suddenly on June 2nd and was buried at Warriston Cemetery, Edinburgh.

Stockman was joint editor of the *Journal of Comparative Pathology and Therapeutics*, a member of the Council of the Royal College of Veterinary Surgeons, President of the Royal College of Veterinary Surgeons for the year 1924–25, a former member of the Council of the Royal Society of Tropical Medicine and Hygiene, member of the managing committees of the Tropical Diseases Bureau and Imperial Bureau of Entomology, and a member of the Board of Governors of the Royal Veterinary College, London. He had edited Walley's "Meat Inspection," among other publications. He received the honour of knighthood in 1913. He married in 1908 Ethel, elder daughter of Sir John McFadyean, and leaves a widow and two daughters.

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THE LATE DR. W. HOOD.—Dr. William Hood, who died at York on May 27th at the age of 88, had an unusually interesting life. He was born at York, the son of a wine merchant, and was educated at St. Peter's School. As a lad he served as apprentice to a doctor in St. Leonards before going to St. Bartholomew's Hospital, and after qualifying as M.R.C.S. Eng. in 1860 and as L.S.A. in 1861, went back for a time to York as an assistant. Then he became surgeon in the Royal West India Mail Service and worked on the paddle boats running between Mexico and Panama. From this time onwards he travelled much, and at the age of 73 set out alone on a tour of Russia and Finland. Crossing Russia with the idea of getting through to Persia he was held up on the frontier, but succeeded in reaching Baku and made his way home by way of Vienna. A year later he went round the world, also unaccompanied, and his robust health is shown by the fact that until two years ago he enjoyed bicycling. Dr. Hood settled in practice at York in 1863 and married Miss Frances Lockwood, a cousin of the late Sir Frank Lockwood, M.P. He became medical officer to the York Union and served the city in that capacity and as public vaccinator for nearly 50 years, retiring in 1911. He was a keen collector of antiques, and especially of old prints. Dr. Hood's wife died in 1910; he leaves a daughter and four sons, one of whom is a member of the medical profession.

# Medical News.

UNIVERSITY OF LONDON.—At examinations held recently the following candidates were successful:—

THIRD (M.B., B.S.) EXAMINATION FOR MEDICAL DEGREES.

*Honours.*—Kathleen M. Bowman-Manifold (*a*, *b*), London Sch. of Med. for Women; Robert B. Brew (*b*), Univ. Coll. Hosp.; Anacletus Byrne-Quinn (*d*), St. Thomas's Hosp.; Joseph T. Fathi (*d*), London Hosp.; Margaret A. Harrison (*a*) and Marjorie Low (*a*), London Sch. of Med. for Women; Mary C. Luff (*b*), Univ. Coll. Hosp.; William A. Mill (*d*), Guy's Hosp.; Joseph Shepherd (*a*), Univ. Coll. Hosp.; Hyman Simmonds (*d*), St. Bart.'s Hosp.; J. H. Simmons (*a*), King's Coll. Hosp.; Jean L. Smith (*a*), Charing Cross Hosp.; Dorothy E. Stewart (*c*), London Sch. of Med. for Women; and Robert M. Walker (*d*, *e*, University medal), Univ. Coll. Hosp.

(*a*) Distinguished in Medicine. (*b*) Distinguished in Pathology.
(*d*) Distinguished in Surgery. (*e*) Distinguished in Midwifery.

*Pass.*—Russel C. Amies, St. Thomas's Hosp.; Constance E. Appleton, King's Coll. Hosp.; Edgar C. Archer, St. Thomas's Hosp.; Edward Bacon and Roderick T. Bannister, St. Bart.'s Hosp.; James M. Barnard, Charing Cross Hosp.; Cyril E. Beare, Middlesex Hosp.; Harold C. Beccle, Guy's Hosp.; John G. Y. Bell, King's Coll. Hosp.; Judah S. Benzecry, Univ. Coll. Hosp.; Samuel Berman, Guy's Hosp.; Frank A. Bevan, St. Bart.'s Hosp.; Owen P. Bewers, St. George's Hosp.; Margery G. Blackie, London Sch. of Med. for Women; John R. Blazé, Ceylon Med. Coll. and Univ. Coll. Hosp.; Anna M. V. Bonhote, King's Coll. Hosp.; Harry C. Boyde, St. Bart.'s Hosp.; Lucy Burnett and Olive K. Burnett, London Sch. of Med. for Women; Laurence W. Cann, Guy's Hosp.; Elizabeth J. Carpenter, London Sch. of Med. for Women; Walter S. Chapman, Univ. Coll. Hosp.; Francis W. Charman, King's Coll. Hosp.; Enid Clarke, London Sch. of Med. for Women; Violet H. Comber, Univ. Coll. Hosp.; Louis N. R. Comty, London Hosp.; Victoria M. Crosse, London Sch. of Med. for Women; Evelyn J. Curtis, King's Coll. Hosp.; Philip E. J. Cutting, St. Bart.'s Hosp.; Gweneth M. Daniel, Westminster Hosp.; David J. Davies, Middlesex Hosp.; Thomas D. Deighton, St. Bart.'s Hosp.; Mathew De Lacey, London Hosp.; Alma Downes-Shaw, King's Coll. Hosp.; George E. Ellis, St. Bart.'s Hosp.; Harry G. Estcourt, Middlesex Hosp.; William G. Evans, St. Mary's Hosp.; Christabel S. Eyre, Charing Cross Hosp.; Rachel D. Fox, London Sch. of Med. for Women; Duncan B. Fraser, St. Bart.'s Hosp.; Ernest B. Garrett, Univ. Coll. Hosp.; Winefride M. Gibson, Charing Cross Hosp.; John F. E. Gillam, St. Thomas's Hosp.; Edith L. Gould and Agnes H. S. Gray, London Sch. of Med. for Women; Francis H. K. Green, St. Bart.'s Hosp.; Charles S. Hallpike, Guy's Hosp.; Helen M. Harris and Leila M. Hawksley, London Sch. of Med. for Women; Thomas R. Hill, Guy's Hosp.; Katherine M. Hirst, London Sch. of Med. for Women; Janet K. Holgate, Univ. Coll. Hosp.; Ruth T. Hurnard, London Sch. of Med. for Women; Kenneth M. N. Isaacs, London Hosp.; Arthur D. W. Jones, Westminster Hosp.; Ronald H. Knight, St. Bart.'s Hosp.; Geoffrey L. S. Kohnstam, King's Coll. Hosp.; Mary Langdon-Down, London Sch. of Med. for Women; Nora M. Leesmith, St. Mary's Hosp.; Samuel Lerner, Univ. Coll. Hosp.; Lewis O. Lindsay, London Hosp.; Dorothy M. Llewellin, Westminster Hosp.; Kathleen M. Lyons and Duncan C. McIntosh, Univ. Coll. Hosp.; James H. Macpherson, King's Coll. Hosp.; Joan G. Malleson, Charing Cross Hosp.; Eva M. Malmberg, King's Coll. Hosp.; George R. Marcano, St. Thomas's Hosp.; Frank Marsh, Guy's Hosp.; Derrick J. Martin, London Hosp.; Florence I. J. Masterman and Dorothy G. Medway, London Sch. of Med. for Women; Alfred Mitchell, King's Coll. Hosp.; John P. Monkhouse, St. Mary's Hosp.; Mary A. Monro and Florence I. R. Moore, London Sch. of Med. for Women; George S. Morgan, St. Bart.'s Hosp.; Gwyn J. Morris, Middlesex Hosp.; Norman Moulson, St. Bart.'s Hosp.; Margaret I. Neal, London Hosp.; Grace H. Nicolle, London Sch. of Med. for Women and St. Mary's Hosp.; Gwynedd Mary E. Olive, London Sch. of Med. for Women; John O. Oliver, St. Thomas's Hosp.; John Parrish, St. Bart.'s Hosp.; Howard L. Peake, Guy's Hosp.; John Pearce, Westminster Hosp.; Noël R. Pooler, St. Mary's Hosp.; Dorothy F. Pratt, London Sch. of Med. for Women; Leslie Reuvid, Univ. Coll. Hosp.; Gordon H. Roberts, Charing Cross Hosp.; Victoria A. Roberts, London Sch. of Med. for Women; Allan B. Robinson, St. Thomas's Hosp.; May E. Rogers, London Sch. of Med. for Women; Harold N. Rose, St. Bart.'s Hosp.; Annie E. G. Rowlands, Univ. Coll. Hosp.; Marjorie Rushbrooke, University of Birmingham; Doris M. F. Russell, London Sch. of Med. for Women; Alan R. Rutnam, Middlesex Hosp.; Joseph Ryland-Whitaker, University of Edinburgh; Frederick W. Schofield, Guy's Hosp.; Thomas A. Seekings, Univ. Coll. Hosp.; Constance G. Sloan, St. Mary's Hosp.; Leonard Smalley, St. Thomas's Hosp.; Rachel M. S. Smellie, St. Mary's Hosp.; Beatrice G. Smith, Univ. Coll. Hosp.; Ralph Stanford, London Hosp.; Adrian L. Stephen and Ian H. Stevens, Univ. Coll. Hosp.; Frederick O. T. Strange, King's Coll. Hosp.; Basil R. Sworn, St. Thomas's Hosp.; Josephine I. Terry, St. Mary's Hosp.; Basil M. Tracey and Herman Treisman, St. Bart.'s Hosp.; Kathleen C. Vost, St. Mary's Hosp.; Larner B. Ward, St. Bart.'s Hosp.; Hilda M. Weber, Univ. Coll. Hosp.; Janet Welch, London Sch. of Med. for Women; Harry V. Wells, Charing Cross

Hosp.; William S. Whimster, Guy's Hosp.; Dahlia Whitbourne, Gwendolen I. Wilkins, and Katharine G. L. Williams, London Sch. of Med. for Women; Ada R. Winter and Dorothy E. Wright, Univ. Coll. Hosp.; and John C. Young, Guy's Hosp.

UNIVERSITY OF LONDON CLUB.—A reception will be held by the chairman, Dr. Walter Seton, and members of the committee of the club, at the Club House, 21, Gower-street, London, W.C., on Tuesday, June 22nd, from 8.30 to 11.30 P.M., to meet the Vice-Chancellor, Prof. Ernest Gardner, and the members of the Senate.

INDIAN MEDICAL SERVICE DINNER FUND.—The annual dinner of the Indian Medical Service will be held at the Trocadero Restaurant on Wednesday, June 16th. Lieut.-Colonel R. H. Elliot will take the chair. Tickets and all particulars may be had from the joint hon. secretary, Colonel J. J. Pratt, 18, Nevern Mansion, Warwick-road, London, S.W. 5.

THE LATE PROF. BABÀK.—Edward Babàk, professor of physiology in the Masaryk University and Veterinary College in Brno, Czecho-Slovakia, died suddenly on May 29th, at the age of 53. His researches on the regulation of the respiratory movements are well known and his work on the influence of the endocrine glands on the metamorphosis of amphibia is no less important. His last published work is a book on the Biology of the Child. He was a remarkable teacher and built up a considerable school of physiology. Until 1918, when he was entrusted by the Government with the organisation of the Masaryk University and Veterinary College in Brno, he held the post of professor of physiology at the Charles University of Prague. Prof. Babàk was the founder of the Biological Society of Czecho-Slovakia and of the journal *Biologicke Listy*.

ROYAL COLLEGE OF SURGEONS OF ENGLAND: *Jacksonian Prize.*—The subject for this prize for 1926 is the Pathology, Diagnosis, and Treatment of Abscess of the Brain. The subject for 1927 is the Pathology, Diagnosis, and Treatment of Bronchiectasis and Abscess of the Lung. The dissertations for the prize for either year must be delivered at the College not later than Dec. 31st of that year.

*Cartwright Prize.*—The administration of the fund for this prize, founded by the "Association of Surgeons practising Dental Surgery" with the object of commemorating the services of Samuel Cartwright, F.R.C.S., in improving the status of the dental profession, has been entrusted to the Royal College of Surgeons of England, and the prize is now offered for competition under the following conditions. It will be awarded quinquennially, the next award being for the five years ending Dec. 31st, 1930. The prize consists of a medal executed in bronze and an honorarium of £85. The subject for the essays to be submitted in competition for the prize is the Ætiology, Pathology, and Treatment of Chronic General Periodontitis (Pyorrhœa Alveolaris). Candidates must be persons engaged in the study or practice of dental surgery and possessing qualifications capable of registration under the Medical Acts of the United Kingdom. Further particulars as to both these prizes may be obtained from the Secretary at the College.

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION.—Two clinical demonstrations will be held on June 16th. At 12 noon Mr. Greeves will give a demonstration in Ophthalmology at the Royal London Ophthalmic Hospital, City-road, E.C., and at 2 P.M. Mr. Sidney Boyd will hold a surgical one at the Hampstead General Hospital, Haverstock Hill, N.W. From July 5th to 17th the National Hospital for Diseases of the Heart will hold an intensive course. Beginning on the same date there will be an afternoon course at the Hospital for Diseases of the Skin, Blackfriars. Instruction will be given in the out-patient department, and venereal clinics will be held bi-weekly. Special attention is drawn to the one week's special course in obstetrics which the City of London Maternity Hospital hopes to begin on July 5th, of which further details will be announced later. There will be a fortnight's special course of demonstrations at the Royal Eye Hospital from July 12th to 24th, from 3 P.M. onwards. All the members of the staff of the hospital will participate in these and will demonstrate on the various aspects of diseases of the eye. There will be an intensive course at the Prince of Wales's General Hospital, Tottenham, N., from July 19th to 31st, in medicine, surgery, and the specialties. Clinics will be held throughout the day in the various departments of the hospital and there will also be demonstrations in Fevers and Mental Diseases. From July 19th to August 14th the West End Hospital for Nervous Diseases will hold a late afternoon course (from 5 o'clock) in Neurology. Copies of all syllabuses, of the General Course programme, and of the *Post-Graduate Medical Journal* may be had on application to the Secretary of the Fellowship of Medicine, at 1, Wimpole-street, London, W. 1.

ROYAL COLLEGE OF PHYSICIANS, EDINBURGH.—The George Alexander Gibson Memorial lecture on the Failing Heart will be delivered in the hall of the College on June 23rd and 24th, beginning each day at 5 P.M., by Dr. John Cowan.

Dr. Gerhard Hotz, professor of surgery at the University of Basle and director of the Surgical Clinic, died on June 5th of a perforated gastric ulcer, in his forty-sixth year.

LONDON (R.F.H.) SCHOOL OF MEDICINE FOR WOMEN.—On June 25th, at 3.30 P.M., Sir John Ferguson will present prizes and certificates. Lady Barrett, Dean of the School, will be in the chair.

A NEW solarium in connexion with the Tuberculosis Dispensary, 108, Grange-road, Bermondsey, will be opened on June 12th, at 3 P.M., by the Mayor of Bermondsey (Councillor I. Stokes). An address on Sunlight and Open Air will be given by Dr. Leonard Hill, F.R.S.

THE CRIPPLE PROBLEM.—Sir Robert Jones, Emeritus President of the British Orthopædic Association, will give an address, for the Essex County Council, on the Cripple Problem, at River Plate House, 7–9, Finsbury-circus, London, E.C., at 3 P.M., on Friday, June 18th.

Dr. Norman Tattersall, who has been for the past 14 years tuberculosis physician for the Mid-Glamorgan area of the Welsh National Memorial Association, has been appointed tuberculosis physician to the City of Leeds. On May 22nd, at Bridgend, Glamorgan, he was the guest of a number of his medical friends at a dinner at which a bureau and illuminated address were presented to him.

A WINDFALL FOR DUBLIN HOSPITALS.—By his will the late Mr. William Dobbs McDonnell, of Shankill, Co. Dublin, who died on March 24th, bequeathed the residue of his estate, subject to certain legacies, to three Dublin hospitals. The question as to which of the Dublin hospitals should benefit was left to the President of the Royal College of Surgeons, Mr. R. C. B. Maunsell. Mr. Maunsell has now decided that the residue of the estate, amounting to about £19,000, is to be divded equally between Sir Patrick Dun's Hospital, Mercer's Hospital, and the Royal Hospital for Incurables.

ROSS INSTITUTE FOR TROPICAL DISEASES.—The Prince of Wales will on July 15th formally open the Ross Institute and Hospital for Tropical Diseases at Tibbett's Corner, Putney Heath. The Institute has been founded to commemorate the twenty-fifth anniversary of the discovery by Sir Ronald Ross of the transmission of malaria to human beings through the bite of the anopheline mosquito. It will be devoted to laboratory research and clinical investigation. Its objects are to carry on intensive research work in the prevention and treatment of tropical diseases, to assist medical men interested in such diseases to make researches, to receive in the hospital sufferers from tropical affections, and to create more interest in malaria and disease control work. Bath House, a large modern residence, has been bought and adapted at a cost of about £25,000, and the working expenses are estimated at from £8000 to £10,000 a year. The first patient was Sir Ronald Ross himself, a resident of Putney, who was taken ill in November last, but was able to leave in five days.

ROYAL SOCIETY OF MEDICINE.—At the social evening held on June 7th Prof. Frederick Hobday gave a short address entitled "Our Animal Friends as Patients." He claimed that animals have the right to receive the best possible attention which modern veterinary skill can give them, and their owners should see that they receive it. He proceeded to consider under the headings of the various sections which compose the Royal Society of Medicine the question of veterinary in comparison with human treatment, and showed on the epidiascope cases in which the treatment of animals by modern medicine and surgery was almost identical with that given by the physician and surgeon to man. Attention was drawn to those common contagious diseases of domestic pets which were likely to infect man. Pictures were shown of the methods applied in the Royal Army Veterinary Corps during the war for the comfort of the horses and mules on each of the fronts. Referring to the intelligence, almost human, of horses and dogs, he gave detailed accounts of the experiences he had had with highly trained individual animals, showing that the reasoning powers of these creatures can be developed to a wonderful extent. The lecture was preceded by a conversazione, at which a large number of specimens were shown.

RETIREMENT OF THE REGISTRAR-GENERAL OF THE IRISH FREE STATE.—Sir William J. Thompson has just retired from the office of Registrar-General of the Irish Free State, having reached the limit of age. He was appointed to the office in 1909, having previously been a physician in Dublin and senior physician to Jervis-street Hospital. He had the chief responsibility for carrying out the census of 1911 and had much of the work of the preparation for the recent census. During his tenure of office he maintained the friendliest relations with medical men who were brought into touch with his department, and the profession in general regrets his retirement. It has been announced that the Government does not intend to fill the vacancy, but that in future the duties of the office will be performed by an official of the department of Local Government and Public Health.

TUBERCULOSIS CONFERENCE.—The twelfth annual conference of the National Association for the Prevention of Tuberculosis is to be held in Glasgow from Thursday to Saturday, July 1st to 3rd. The Lord Provost of Glasgow will formally open the conference at the McLellan Galleries, Sauchiehall-street, at 10.30 on Thursday morning, when the subject for discussion will be the Provision for the Care of Non-pulmonary Tuberculosis, to be opened by Dr. A. S. M. MacGregor, M.O.H. Glasgow, and Mr. James Taylor, consulting surgeon to the Glasgow Corporation Hospitals and Sanatoria. In the afternoon Sir Robert Philip will open a discussion on the Actual Place and Function of the Tuberculosis Dispensary in the Tuberculosis Scheme. A formal reception by the Lord Provost and magistrates will be held at 7.30 P.M. On Friday papers will be read as follow: on Experimental Studies in Tuberculosis, by Prof. C. H. Browning; on the Age-Factor in the Incidence of Tuberculosis, by Dr. J. A. Wilson; on Some Experiences in the Treatment of Tuberculosis by Artificial Sunlight, by Dr. Alexander Smith; and on Glasgow's Solution of the Smoke Problem, by ex-Bailie W. Brownhill Smith. On Friday afternoon visits will be paid to Corporation housing schemes and sanatoria and to the Hairmyres Tuberculosis Colony. On Saturday demonstrations will be given on radiography of the chest, the methods of treatment of non-pulmonary tuberculosis, and visits paid to various dispensaries and sanatoria. Further information from the Secretary of the National Association, 20, Hanover-square, London, W. 1.

PRESENTATION TO DR. HERBERT JONES.—Dr. Gerard Steel, President of the Herefordshire Medical Society, accompanied by Dr. John Steed, hon. treasurer of the society, and Dr. J. R. Bulman, hon. secretary of the Hereford Division of the B.M.A., recently presented a testimonial to Dr. Herbert Jones which took the form of a Sheffield plate casket, suitably inscribed, and containing a cheque for £250; it was accompanied by a list of the names of the subscribers. Dr. Steel referred to the privilege and honour conferred upon him in that it fell to his lot to present the casket and its contents as a token of the esteem in which he (Dr. Herbert Jones) was held by the whole profession. He then read extracts from letters which had been received from subscribers to the testimonial and continued: "You must feel great satisfaction in hearing these many expressions of gratitude for the good work you have done. They are a certain proof that the whole of your professional life is approved and acknowledged by your confrères, who sincerely wish you the peace and comfort in your retirement which you so richly deserve. At the same time they hope that you will always be available for them to ask for your help in all cases of difficulty when your ripe knowledge, experience, and judgment will be invaluable, as has ever been the case, for you have never failed in your integrity to your professional brethren by your tact and kindness to one and all." Dr. Herbert Jones thanked everyone who had helped in the testimonial. The work had ever been a labour of love. In glancing through the names on the list of subscribers he was much touched to notice not only the names of many old friends, but of several men who were scarcely known to him.

The following is the final list of subscribers:—

*£10 10s.*—*West of England Branch of the Soc. of M.O.H.; Midland Branch of the Soc. of M.O.H. (per Dr. Ridley Bailey).

*£3 3s.*—†Sir William H. Willcox, K.C.I.E.

*£2 2s. 6d.*—Dr. Alex. Robb, Edinburgh.

*£2 2s.*—Drs. H. Hanslow Brind, West Byfleet,; *Mabyn Read, and *P. H. Stirk.

*£1 1s.*—*Drs. George Adkins, *F. J. Allan, Sir Robert A. Bolam, Newcastle-on-Tyne; *Joseph Coates, Howard Davies, Pontypridd; R. Green, Stroud; H. W. Harding, Edmonton; *A. Bostock Hill, T. E. Hincks, Hay; *J. Johnstone Jervis, C. Courtenay-Lord, Orpington; Edward H. Nash, Cranford; *H. Cooper Pattin, *W. G. Savage, *C. E. Tangye, T. M. Tibbets, Old Hill, Staffs; W. W. Wells, Bromyard; ‡ James Wheatley, Shrewsbury; and J. Arthur Wood, Rugby.

*10s. 6d.*—H. Dundas McCall, Leominster.

* Per *The Medical Officer*.
† Per *British Medical Journal*.
‡ *Second subscription*.

# Parliamentary Intelligence.

## HOUSE OF LORDS.

TUESDAY, JUNE 8TH.

*Midwives and Maternity Homes Bill.*

The House went into Committee on the Midwives and Maternity Homes Bill, the EARL OF DONOUGHMORE in the chair.

Part I. of the Bill amends the Midwives Acts, 1902 and 1918. Clause 1 provides that if any person, being either a male person or a woman not certified under the Bill, attends a woman in childbirth otherwise than under the direction and personal supervision of a duly qualified medical practitioner, that person shall, unless he or she satisfies the court that the attention was given in a case of sudden or urgent necessity, be liable on summary conviction to a fine not exceeding £10.

Lord STANMORE moved an amendment to provide that the clause should not apply in the case of a person who, while undergoing training with a view to becoming a duly qualified medical practitioner or a certified midwife, attended a woman in childbirth as part of a course of practical instruction in midwifery. He explained that his object was to safeguard the midwifery training of medical students and pupil midwives. As the clause stood no medical student could attend a woman in childbirth, except under the personal supervision of a qualified medical practitioner. It was possible that, in the future, the courts might hold that the words "personal supervision" implied the actual presence of a qualified medical officer. If that were to be the case the present system of midwifery training would become unworkable. Referring to the training of the students, the noble lord said that it was very unusual where a student had to deal with an emergency case, that the delay of an hour or so before a qualified practitioner came had any bad effect on the patient. The student, having had four years obstetrical training, was in a position to give general treatment while awaiting the arrival of his colleague. He did not think any authority on obstetrics would consider it necessary that a student should be accompanied by a medical man in all the cases that he had to attend. On the contrary, he could not learn his work properly without having responsibility during his period of training. The case of the pupil midwife was very similar to that of the student. An untrained woman had to go through a course of training for 12 months and a trained nurse for six months. Training was carried out under the superintendence of experienced midwives, who were recognised by the Central Midwives Board. It was not only undesirable that they should be subjected to the personal supervision of the medical man in all these cases, but if that supervision was insisted on it might have the effect of greatly reducing the number of midwives.

Viscount KNUTSFORD, in supporting the amendment, said that only the other day all the medical schools in London met and proposed that an amendment should be moved to the Bill very similar to that of Lord Stanmore. He was sure their lordships would accept the amendment with perfect certainty that the women who were being treated would be properly attended to and that the pupils or students would be properly taught. He thought the word "training" in the amendment should be strengthened by the substitution of the words "training recognised by the General Medical Council or the Central Midwives Board." Anything might be "training," and they must be quite sure that nobody was allowed to attend a woman in confinement unless he was going through a properly recognised training.

The Marquess of SALISBURY said it was quite true that since this Bill was read a second time very strong representations had been made to the Ministry of Health and the Government in regard to this particular point. It had been represented to them that if the clause passed in its present form it would lead to considerable difficulty in the training both of medical students and pupil midwives, and would really constitute a great disadvantage to the public interest. On the other hand, of course, they had to safeguard the women concerned and they could not agree to any amendment which did not in its terms adequately protect the women. The amendment proposed by Lord Stanmore was designed to steer a middle course between two extremes, and he thought that on the whole he had succeeded. As regarded the words suggested by Lord Knutsford it ought to be considered between now and the report stage whether they were necessary. He thought Lord Stanmore's amendment was required. They did not want to interfere with the great schools of medical training; that was a matter of national importance. It was a tremendous charity which these women were receiving, because they were attended by the medical students and pupil midwives for nothing. He understood that no medical student would be allowed

to act in these cases except towards the end of his training. In other words, the medical student was almost a qualified doctor before he was allowed to attend midwifery cases. The pupil midwife was not allowed to attend them except in the presence of a trained midwife, who showed her how to do her work. Therefore he thought their lordships might be assured that adequate care was taken.

Lord DAWSON said that the remarks of Lord Salisbury as to whether the public were adequately protected in the course of medical education were of considerable public interest. It was very important that the public should be reassured on that point. The public were adequately protected for this reason. To begin with, the medical student when he started his training had been through several years of preliminary education. He had been trained in the basic sciences on which medicine was built. That was one advantage he had over the midwife. Before he was sent out to practise midwifery he was put through a course of education in the hospital where he was given actual instruction in maternity cases. Having got so far it was very important to send the student out so that he could learn to be self-reliant. One of the most delicate questions in regard to medical education was as to the right moment when the medical student should be sent out to cases on his own, with the right sort of advice in the background. But when he did go out he went with the full knowledge that if the case to which he went was abnormal or any difficulty presented itself he could immediately send for a highly skilled person. It was far better that a medical student should be trained in the habit of self-reliance during his period of education than that he should postpone it until he went into practice and had no one behind him. In actual practice the system worked extremely well. The service was very popular. The patients themselves were attached to the students, largely because they found themselves coming into contact with the innate friendliness which seemed to be part of the make-up of the British medical student. The students, on the other hand, found how closely allied were the human and scientific sides of their art. Altogether it was an excellent arrangement, not only in regard to the training in medicine, but also to the training in the management of people. The patients got very fond of the students and the latter generally ended their week on duty with larger hearts, but certainly with emptier pockets. He had been through this training himself. Before now he had washed a baby and baptized a baby; how efficiently he did not know, but he rather thought he found the baptism more easy than the washing. He thought that the machinery of medical education and the public interest would both be damaged if some sort of amendment as that proposed by Lord Stanmore was not inserted in the Bill.

The amendment was agreed to, and Clause 1 as amended was added to the Bill.

Lord STRACHIE moved to leave out Subsection (1) of Clause 2, which provides that where a midwife has been suspended from practice in order to prevent the spread of infection she shall, if she was not herself in default, be entitled to recover from the local supervising authority such amount by way of compensation for loss of practice as is reasonable in the circumstances of the case. He said that he moved the amendment at the request of the County Councils' Association. So far as they were aware there had never been any injustice done in regard to this matter. Sir Kingsley Wood, the Parliamentary Secretary to the Ministry of Health, had defended this clause, because he said that one or two authorities in the past had not acted fairly to the midwives who were suspended. He (Lord Strachie) thought that it would have been more reasonable if Sir K. Wood had taken the trouble to inform the Committee who these local authorities were and of the circumstances of the particular cases to which he referred. If there were only one or two cases he did not think this clause was necessary.

The MARQUESS OF SALISBURY said it was vital to remember that if there was the least temptation on the part of those concerned to conceal possible contact with infection, grave risks would arise. Although he was a very great advocate of local government independence the Government were more concerned with the safety of the patients and were very anxious to go the whole length they could in order to protect them. Lord Strachie had truly said that the great body of county councils would act with due regard to the interests of their patients and in a proper public spirit in matters of this kind. The Government wished to reassure the midwives themselves; to make them certain that they would get compensation, in ensuring that they would run no risk of carrying infection into the homes of the patients and thereby risking their lives. For that reason he hoped the amendment would not be pressed.

Lord STRACHIE withdrew the amendment.

In Part III. of the Bill, Clause 11 interprets the expressions used. It is defined that the expression "Maternity home" shall not include "any hospital or other premise for the conduct of which a duly qualified medical practitioner resident therein is responsible."

The ARCHBISHOP OF CANTERBURY moved an amendment providing that there should be lodged with the local supervising authority a certificate signed by two duly qualified medical practitioners, practising or residing in the county, not being in partnership with the first-mentioned practitioner, or each other, and having no financial or other interest in the hospital, to the effect that the premises and their equipment were in all respects suitable for the purpose, and that the medical practitioner carrying on or proposing to carry on such a hospital was a fit and proper person to carry it on. He said that the clause, as it stood, practically said that any man who had attained due qualification in medical work was to be exempted from inspection if he opened a home for the purposes referred to in the Bill. He yielded to no one in his whole-hearted admiration for the medical profession. No profession in the world stood higher in regard to the character of its members and in regard to their public spirit and desire in all cases—and their qualification in almost all cases—to act in the public interest and to do what was right. But even in that great profession there might here and there be a man who, while possessing the technical qualifications, could not be regarded as altogether relieved from the possible suspicion of having other motives in what he might be endeavouring to do. In order to protect the homes, the medical men, and the public there ought to be some qualification of the complete exemption which was offered to a man who might be opening a home, dealing with this delicate and difficult matter, entirely on his own responsibility. He had taken the wording of the proposed safeguard from the General Purposes Act of the London County Council (which body had the same matter to deal with), which laid down the restrictions in its case.

Lord BANBURY supported the amendment. It was absolutely necessary that there should be some safeguard to prevent a person starting a home of this sort merely in order to make money out of it. Such a person perhaps might be not properly qualified, or might not have been a success as a medical practitioner. He was not quite certain that all nursing homes were what they should be.

The MARQUESS OF SALISBURY said that there was no difference of opinion between the Government and the Archbishop of Canterbury as to the absolute necessity of some such limitation of the clause. Undoubtedly what Lord Banbury had said was true—that there were a certain number of maternity homes which were anything but admirable places; in fact, very disreputable. The only real question was what form the amendment should take. There was a good deal to be said for the Archbishop's proposal, but the method of trying to effect a safeguard by a definition and by a certificate of other medical practitioners was not a wholly satisfactory way of meeting the difficulty. The suggestion, of course, was that there were a certain number of black sheep in the medical profession who might misconduct a maternity home. The number might be very small out of all the medical men in the country, but it would certainly not be impossible for one black sheep to find two other black sheep. That was really the only protection which the Archbishop's proposal gave. No doubt they must not be technically in partnership with the medical practitioner himself; but there were all sorts of indirect methods by which evasion could be carried out. The Government therefore thought the object in view would be better achieved by a safeguard of a totally different kind. Instead of trying to fortify one medical practitioner by two others, they suggested that it should be made a matter of discretion by the supervising authority. They proposed that the supervising authority should have absolute discretion to say that they would not certify a particular home, and in that way, through having local knowledge, they would be able to protect the public and the women concerned. That was to say, only those would be exempted from the provisions of Part II. of the Bill who got an exemption from the local supervising authority, leaving it open to the authority to refuse an exemption when they thought fit. That would be the only really efficient safeguard. It might be said that to leave the discretion wholly in the hands of the supervising authority was going too far. The Government agreed with that view, and they were providing an appeal in order to prevent any possible injustice following upon this amendment.

Viscount HALDANE said that on the whole he preferred the Government amendment, and he thought the House should adopt it.

Lord MERRIVALE said that the proposal of Lord Salisbury was much more stringent than that of the Archbishop of Canterbury. He supposed that the local supervising authority would not see fit to exempt anyone from the operation of the general law unless they were satisfied that they ought to be so exempted.

The ARCHBISHOP OF CANTERBURY said that after what had been said he would withdraw his amendment provided that

he might bring it up again on the report stage if he found it to be necessary.

The Archbishop of Canterbury's amendment was by leave withdrawn.

Amendments to Clause 11 were moved by Lord SALISBURY providing (1) that any hospital or other premises, for the conduct of which a duly qualified medical practitioner resident therein was responsible, might be exempted from the provisions of Part II. of the Act by the local supervising authority; and (2) that any person who was aggrieved by the refusal of such authority to grant exemption, or by the withdrawal of exemption might appeal to the Minister of Health, who might give such directions to the local authority as he thought proper.

Viscount KNUTSFORD said that if the Bill passed in its present form any hospital or other premises maintained or controlled by a Government department or local authority or by any other body of persons constituted by special Act of Parliament, or incorporated by Royal Charter would be exempted from registration. Hospitals under a Government department or a local authority needed inspection rather more than others. He once saw a Poor-law infirmary in Great Britain where there were 800 patients, 200 of whom were very seriously ill indeed. There was a resident medical officer who was responsible for the management, and therefore that hospital would be exempted from this Act. There was a filthy syphilis ward, and only one medical officer who had to do all the post-mortems and attend the delivery of women. She was a girl 26 years of age, holding her first appointment. When he exposed this case he was called a liar. The City Fathers denied that such a thing ever existed, but he was glad to say that they had to admit it in the end and the conditions were altered. That was an instance where inspection by the supervising authority would have done infinite good. So far as the voluntary hospitals were concerned the more they were inspected the more those who were responsible for them would be pleased. He hoped the Government would agree to take out the provision exempting these institutions from registration and inspection.

The Marquess of SALISBURY said that Lord Knutsford would like to see all hospitals brought within the restrictive provisions of the Bill. That was a view which, coming from him, one was bound to treat with very great respect, but his (Lord Salisbury's) impression was that the great body of hospitals did not quite share the noble lord's opinion. What the Government had to consider was how far they could carry exemption safely, and the clause together with the amendments had been drawn so as to cover the ground as well as possible.

Lord Salisbury's amendments were agreed to and Clause 11 was added to the Bill.

The Bill passed through Committee and was reported to the House.

## HOUSE OF COMMONS.

### THURSDAY, JUNE 3RD.

*Progress in Housing Construction.*

Mr. TREVELYAN THOMSON asked the Minister of Health the number of houses at present sanctioned for construction under the various Housing Acts, and similar figures for a year ago.—Mr. NEVILLE CHAMBERLAIN replied: Up to the end of May, 1926, 292,067 houses had been authorised for erection under the Housing Act of 1923 and 126,138 under the Act of 1924. The corresponding figures for May, 1925, were 205,030 and 58,359 respectively.

*Economy in Poor-law Relief.*

Mr. CONNOLLY asked the Minister of Health why he had intimated to the Newcastle board of guardians that any further loans required by them and sanctioned by him would be contingent on their acceptance of the suggestions contained in Ministry of Health Circular 703, which placed the maximum amount of relief at 35*s.* per week; whether he was aware that this circular stated that the instructions concerned the general stoppage of industry, which no longer existed; and whether he proposed to give the House an opportunity of discussing the effects of such provisions on the health of the Poor-law relief recipients, and particularly the children.—Mr. NEVILLE CHAMBERLAIN replied: It has already been necessary to sanction the raising by this board of guardians of temporary loans to the amount of £200,000, and, in view of their financial position, it is essential that every practicable economy should be adopted. The reduced scales of relief now in force are still higher than has been found necessary in a number of other unions. The basis of Circular 703, which is incorrectly described by the hon. Member, was that guardians should make adequate arrangements for carrying out their statutory duty of relieving destitution while taking all possible steps to conserve their financial resources in view of the demands that might be made upon them. The principles of the circular will continue to be applicable during the coal dispute which must result in increasing demands upon the guardians. The question of discussion in this House is one for arrangement through the usual channels.

*Report of the Lunacy Commission.*

Sir CHARLES OMAN asked the Minister of Health when the Report of the Royal Commission on Lunacy could be laid before the House.—Sir W. JOYNSON-HICKS (Home Secretary) replied: I am unable to state the date on which this report will be laid before the House, but I understand that the Royal Commission hope to be in a position to present their report before the end of next month.

### FRIDAY, JUNE 4TH.

*Lead Paint Poisoning.*

On the order for the second reading of the Lead Paint (Protection against Poisoning) Bill,

Sir W. JOYNSON-HICKS (Home Secretary) said that two proposals were made at Geneva for dealing with the evil of lead paint poisoning. One was that the use of lead paint should be prohibited altogether, and the other that every effort should be made by regulation to minimise the danger arising from its use. There was a very great demand for the use of lead paint, and the employers who used it told him quite clearly that the substitutes that had been suggested were not satisfactory. He was not prepared at present to go the whole length of prohibition, because it had not been proved to his satisfaction that it was necessary. But he was prepared to give the Labour Party the half-loaf of regulation, and the choice that day lay not between half a loaf or a whole loaf, but between half a loaf and no bread at all. The regulations contemplated by this Bill had been agreed to by employers and employees, and they would enable substitutes to be used in order to reduce—he would not put it higher than that—the possibility of poisoning by lead paint. He was not going to say that this was final; it was an experimental measure. He was as determined as anyone on the Opposition side of the House to do all he could to reduce the evils of lead poisoning, and if he found that the regulations were not sufficient, and that lead poisoning still went on, he would not hesitate to come to the House again for a Bill which would prohibit the use of lead paint. He had great hopes that the effect of the regulations would be, if not to stamp out the evil completely, very largely to reduce it, and to make the conditions of the workers better, happier, and far less dangerous than they had been in the past.

Mr. R. J. DAVIES, speaking on behalf of the Labour Party, pointed out that the Bill did not ratify the Convention passed at Geneva, and contended that it was grossly unfair for the Home Secretary to ask the House to pass a Bill which in no way met the demands of that Convention. No votes had been cast against the Convention at Geneva, and there had been only one abstention. In 1924 the Labour Government produced a Bill embodying the Convention. The master painters and the operatives were at one in favour of ratification, which was more important in view of the increased number of men suffering from lead paint poisoning. In 1919 the total number of sufferers in this country was 207; in 1922 the number was 246; in 1923 it was 337; and in 1924 it had increased to 486. If this Bill was carried the Home Office would be unable to enforce the regulations. There were about 70,000 house painters and decorators in the country, and they were employed in twos and threes in different houses. How was it possible in these circumstances to enforce the proposed regulations?

Sir W. JOYNSON-HICKS said it was proposed to increase the number of inspectors, and it was his experience that trade-unions quickly warned their members of the existence of new regulations, and that the men soon reported breaches to their unions.

Mr. DAVIES said that the Home Secretary was too sanguine. If the Office of Works, the chief painting department of the State, dispensed with white lead in paints he saw no reason why its use should not be prohibited throughout the country.

Lord H. CAVENDISH-BENTINCK, a Unionist Member, said that the regulations that were proposed would not only be useless, but would prejudice the onward progress of reform. How long were they to wait, and how many people were to have their health ruined while the Home Secretary was waiting? He was more annoyed than he could say that a Conservative Government should have brought in such a rotten and useless measure.

Mr. VIANT, in moving the rejection of the Bill, said he was speaking from experience as a man associated with the trade. When a painter caught the disease it was often transferred by him to his wife and children. Adequate substitutes existed for lead paint, and its use in interior work was quite unnecessary. One of the regulations provided that before a painter got employment he must show a clean bill of health. That would impose upon the painter and his

family the taint of pauperism unless it was accomplished by the payment of financial assistance while the painter was unemployed. Factory inspection to-day was a farce, and if the regulations proposed were practicable they would also be a farce.

After further discussion,

Captain HACKING (Under-Secretary to the Home Office) said it must be remembered that since the Geneva Convention the position had been very largely modified, and procedure by regulation had become more practicable because of the inventions that had taken place, and one of the most important was the invention of waterproof sandpaper.

The second reading of the Bill was carried by 131 votes to 56—majority 75.

MONDAY, JUNE 7TH.

*The Taxation of Medicines.*

The House went into Committee on the Finance Bill, Mr. J. HOPE, Chairman of Committees, in the chair.

Clause 2 provides that the additional duties of excise imposed by Section 11 of the Finance (No. 2) Act, 1915, upon medicines liable to duty shall continue to be charged, levied, and paid until August 1st, 1927.

Captain WEDGWOOD BENN asked the Financial Secretary of the Treasury to look into this clause which, he said, dealt with matters going back to the seventeenth century. It would be much simpler from the point of view of the taxpayer if the Treasury would produce a clause showing what would be levied instead of referring in the clause to another Act, and then by that to another Act, and so on back to nearly the year 1600.

Mr. R. MCNEILL (Financial Secretary to the Treasury) said that when Captain Wedgwood Benn raised this matter last year his predecessor gave an undertaking that the matter would be considered before the introduction of the present Finance Bill with a view to a codification of the various old statutes. After consideration it had been decided that codification by itself would be useless. What was needed was a drastic revision of the statutes. That, however, had not been possible before the introduction of the present Finance Bill, but it was intended in the near future to appoint an interdepartmental committee to consider exactly what ought to be done in order to get rid of the superfluity of old and obsolete statutes dealing with particular specifics. There was one particular specific in the schedule called the Elixir of Longevity. He did not think that elixir had succeeded in achieving longevity although it had remained in the schedule to the Statute of 1812. He understood that the elixir was no longer efficacious and that showed that mere codification would not meet the case. He hoped that before this time next year they would have done something to remedy the present state of things in this respect.

The clause was agreed to.

*Health Conditions on Emigrant Ships.*

Colonel DAY asked the Secretary of State for Dominion Affairs if he was aware that the Shaw, Savill, and Albion Company's steamer *Tainui*, which sailed for New Zealand on Jan. 8th, 1926, with 428 third-class passengers, was not adapted or suitable for use as an emigrant ship; that the temporary four- and six-berth cabins were not adequately ventilated; that the bathing and washing arrangements for both men and women were inadequate; and that no water was available in the cabins four days after leaving England; and, in view of these discomforts and the danger to health experienced by these emigrants, would he, in conjunction with the New Zealand authorities, cause full inquiry to be held in this regard.—Sir BURTON CHADWICK (Parliamentary Secretary to the Board of Trade) replied: The *Tainui* was built under Passenger Certificate Survey in 1908, and has since, with the exception of the war period, been engaged in carrying emigrants to New Zealand. Before leaving this country on her last outward voyage, she was surveyed by Board of Trade surveyors, when the ventilation, bathing, and washing arrangements were found to be in excess of the requirements of the regulations. The ship has been again inspected by the Board's surveyors, and they report that the officers and stewards of the ship state that they received no complaint of lack of water in the cabins. The stewards state that the supply tanks were filled regularly each morning from a fresh-water tap fitted in each section of the passenger accommodation.

*Government Nominee on the G.M.C.*

Mr. FORREST asked the Vice-Chamberlain of the Household, as representing the Lord President of the Council, whether the Crown nominee on the General Medical Council would make any annual report to the Government on its proceedings; and whether, in that case, the document would be published.—Major HENNESSY replied: The hon. Member appears to be under some misapprehension. The meetings of the General Medical Council are open to the public and are reported in the daily press and professional journals. The official minutes of the proceedings are published and are supplied to the Privy Council, and are also available to the public.

Mr. HORE-BELISHA asked whether Mr. Hilton Young would answer questions in the House of Commons concerning the General Medical Council.—Major HENNESSY replied that he was afraid he could not answer that without notice.

TUESDAY, JUNE 8TH.

*Crown Nominees on the General Medical Council.*

Viscount SANDON asked the Vice-Chamberlain of the Household, as representing the Lord President of the Council, whether, seeing that the Lord President controlled a large number of nominations to the General Medical Council, he would nominate at once, or at the earliest possible moment, a number of non-professional persons, in view of the fact that the one just appointed could not possibly fill his rôle adequately if alone amongst 37 other medical members.—Major HENNESSY replied: The Crown nominees to the General Medical Council are five in number and nominations can only be made under the statute when vacancies occur.

Viscount SANDON asked the Vice-Chamberlain of the Household, as representing the Lord President of the Council, whether the Lord President's nominations to the General Medical Council were made for life, or on what basis.—Major HENNESSY replied: The nominations of His Majesty, on the advice of his Privy Council, to the General Medical Council are made for five years under the Medical Acts.

## ROYAL MEDICAL BENEVOLENT FUND.

AT the last meeting of the Committee 40 cases were considered and £507 voted to 34 applicants. The following are notes on some of the cases relieved:—

Widow, aged 70, of M.R.C.S. Eng. who practised in Wiltshire and died in 1896. She has worked hard for the last 30 years, and has kept and educated her three children who are now only able to maintain themselves. Applicant has been living with her sister aged 80, but on account of her great age cannot nurse the applicant who has been removed to a nursing home. Only income £98 per annum, and the Fund has been asked to help with the nursing home fees which amount to 2 guineas a week. Voted £6 in three monthly instalments of £2 each.

L.R.C.P. & S., aged 69, who practised in Scotland until ill-health obliged him to sell his practice. Is now suffering from cerebral hæmorrhage and paralysis. Friends have applied to the Fund for assistance to meet expenses otherwise the doctor will have to go to the workhouse. The Hutcheson Charity is also being approached with a view to obtaining some additional assistance. Voted £40 in 12 monthly instalments.

Widow, aged 65, of M.D. Glasg. who practised in the north of Scotland and died in 1903. Two daughters, aged 24 and 22; the eldest is at home, and her only income is £30 per annum, the youngest has just passed her exams., and is now self-supporting. Since 1917 the applicant and her daughters have been fortunate in having a cottage at a nominal rent of £5 per annum, but the farm has now new tenants and the cottage is to be vacated which will involve the applicant in a heavier rent in future. Voted £10.

Widow, aged 47, of M.D. who practised in London and has been an inmate of a mental hospital since 1909. Applicant and son went out to Canada in 1923 and worked on a farm; the son also studied and passed his matriculation and was awarded a scholarship for four years, but was unable to make use of it as towards the end of that year (1924), owing to his eagerness to earn additional money; the physical and mental strain brought on heart trouble which has completely disabled him, and he is now in bed. The applicant is also in very poor health and application for assistance was made to the Fund to help them under these pitiable circumstances. Only income £150 per annum. Voted £10.

Widow, aged 49, of M.B. Edin. who practised in Wales and died in March. Two sons, aged 20 and 16; eldest a journalist earning £120 per annum, and the youngest is at present living with friends. Applicant hopes to get the youngest boy out to Australia. It is estimated that there will be very little left from the husband's estate when everything is settled. Applicant will have to take a post and become self-supporting. Voted £15 in three monthly instalments of £5 each.

M.D. 1880, aged 72, who practised in London but has had to give up practising on account of bad eyesight. His four children help as much as they can, but the brunt of the household expenses falls on the daughter, which leaves insufficient for her own personal needs. Voted £40 in four quarterly instalments of £10 each.

Subscriptions may be sent to the Hon. Treasurer, Sir Charters Symonds, K.B.E., at 11, Chandos-street, Cavendish-square, London, W. 1.

# Medical Diary.

*Information to be included in this column should reach us in proper form on Tuesday, and cannot appear if it reaches us later than the first post on Wednesday morning.*

## SOCIETIES.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.
THURSDAY, June 17th.—5 P.M., DERMATOLOGY (Cases at 4 P.M.).
FRIDAY.—5 P.M., BALNEOLOGY AND CLIMATOLOGY. Annual General Meeting: Election of Officers and Council.

ROYAL SOCIETY OF TROPICAL MEDICINE AND HYGIENE.
THURSDAY, June 17th.—(At 11, Chandos-street, Cavendish-square, W.) 8.15 P.M., Annual General Meeting, preceded by a Demonstration at 7.45 P.M. A paper will be read by Colonel S. P. James, I.M.S. (retd.), of the Ministry of Health, on Epidemiological Results of a Laboratory Study of Malaria in England. The Manson Medal will be presented to Prof. Ettore Marchiafava, of Rome, in recognition of the part he took in the elucidation of the life-history of the parasites of human malaria.

BIOCHEMICAL SOCIETY.
SATURDAY, June 12th (at the Wellcome Physiological Research Laboratories, Langley-court, Beckenham, Kent)—11.45 A.M., Demonstrations, C. G. Pope: A Direct Reading H ion Meter and the Surface Concentration of Phenol in Aqueous Solutions. J. W. Trevan, H. Bainbridge, and J. H. Gaddum: Micro-Volumetric Methods. J. W. Trevan: A New Micro-Balance. A. F. Watson and E. D. F. Langstaff: Stages in the Purification of Culture Filtrates of *B. diphtheriæ*. 2.30 P.M., Communications: C. Dorée and E. C. Barton-Wright: A Note on the Stone-Cells of the Pear. R. L. Mackenzie Wallis: The Corpus Luteum and Cholesterol Metabolism. D. T. Davies, F. Dickens, and E. C. Dodds: Observations on the Properties and Preparation of the Parathyroid Hormone (Collip). H. R. Whitehead: Phosphates and the Growth of Streptococci. A. T. Glenny, C. G. Pope, H. Waddington, and U. Wallace: Variations in Immunity Response to Different Preparations of Diphtheria Toxin. A. F. Watson and E. D. F. Langstaff: The Preparation and Some Properties of Purified Diphtheria Antigen. J. W. Trevan and E. M. Boock: Some Physical Properties of Local Anæsthetics. O. Rosenheim and T. A. Webster: The Antirachitic Properties of Irradiated Sterols, and a Note on Alleged Specific Colour Reactions for Vitamin D.

## LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF PHYSICIANS, Pall Mall East, S.W.
TUESDAY, June 15th.—5 P.M., Sir Thomas Lewis: Observations upon Blood-vessels of the Human Skin. (Third Croonian Lecture.)
THURSDAY.—5 P.M. (Last Croonian Lecture.)

FELLOWSHIP OF MEDICINE AND POST-GRADUATE MEDICAL ASSOCIATION, 1, Wimpole-street, W.
MONDAY, June 14th, to FRIDAY, June 18th.—Special afternoon demonstration in clinical surgery at the Hampstead General Hospital by Mr. Sidney Boyd, Wednesday, at 2 P.M. Special demonstration in clinical ophthalmology by Mr. R. Affleck Greeves at the Royal London Ophthalmic Hospital, Wednesday, at 12 noon. These demonstrations are open to all members of the medical profession without fee.—HOSPITAL FOR DISEASES OF THE HEART AND LUNGS, Victoria Park, E. Special course in chest diseases. The whole hospital is open to post-graduates attending the course, and there are special demonstrations (clinical and laboratory), lectures, &c.—LONDON TEMPERANCE HOSPITAL, Hampstead-road, N.W. Special post-graduate course for practitioners. Daily 4.30 to 6 P.M. Half an hour's lecture followed by one hour's demonstration. Medicine, surgery, and the special departments.—CHELSEA HOSPITAL FOR WOMEN, Arthur-street, S.W. A post-graduate course in gynæcology. Operations and demonstrations daily.—ALL SAINTS' HOSPITAL, Vauxhall Bridge-road. Special course in Urology. Clinical and cystoscopic demonstrations Monday and Wednesday afternoons and evenings, Thursday afternoon and Saturday afternoon, special lecture by Mr. F. McG. Loughnane on Mobile Kidney on Wednesday, June 16th. Further information from the Secretary, Fellowship of Medicine.

LONDON SCHOOL OF DERMATOLOGY, St. John's Hospital, Leicester-square, W.C.
TUESDAY, June 15th.—5 P.M., Dr. Wilfrid Fox: Seborrhœic Affections of the Skin.
THURSDAY.—5 P.M., Dr. J. T. Ingram: Pathological Demonstration.

CANCER HOSPITAL, Fulham-road, S.W.
WEDNESDAY, June 16th.—4.30 P.M., Sir James Dundas-Grant: Cases of Malignant Disease of the Throat or Simulating Such.
FRIDAY.—4.30 P.M., Mr. P. P. Cole: Plastic Surgery in Malignant Disease.

ST. MARY'S HOSPITAL INSTITUTE OF PATHOLOGY.
THURSDAY, June 17th.—5 P.M., Mr. J. E. Barnard: The Microscopy of Filterable Viruses.

NORTH-EAST LONDON POST-GRADUATE COLLEGE Prince of Wales's General Hospital, Tottenham, N.
MONDAY, June 7th.—10 A.M., Surgical Out-patients: Mr. W. E. Tanner. 10.30 A.M., Gynæcological Operations: Mr. A. E. Giles: Throat, Nose, and Ear Operations: Mr. W. Ibbotson. 2 P.M., Medical, Surgical, and Gynæcological Clinics, Operations. 6.30 P.M., Venereal Department.
TUESDAY.—2 P.M., Medical, Surgical, Throat, Nose and Ear Clinics, Operations.
WEDNESDAY.—10.30 A.M., Surgical Operations: Mr. E. Gillespie. 2 P.M., Medical, Eye, and Skin Clinics, Operations. 3.30 P.M., Selected Cases in the Surgical Wards: Mr. E. Gillespie. 5.30 P.M., Venereal Department.
THURSDAY.—10.30 A.M., Dental Out-patients: Mr. E. S. Pierrepont. 2 P.M., Medical, Surgical, and Throat, Nose and Ear Clinics, Operations. 3 P.M., Demonstration of Cases of the Infectious Fevers: Dr. F. Thomson at the North-Eastern Hospital, St. Ann's-road, N. 5 P.M., Operations.
FRIDAY.—10.30 A.M., Eye Operations: Mr. N. Fleming. 2 P.M., Surgical, Medical, and Children Clinics, Operations. 3 P.M., Gynæcological Clinic. 6.30 P.M., Venereal Department.

NATIONAL HOSPITAL, Queen-square, Bloomsbury, W.C.
MONDAY, June 14th.—2 P.M., Dr. Hinds Howell: Out-patient Clinic. 3.30 P.M., Dr. Kinnier Wilson: The Neuro-muscular System (1).
TUESDAY.—2 P.M., Dr. Walshe: Out-patient Clinic. 3.30 P.M., Dr. Grainger Stewart: The Significance of Ocular Symptoms in Neurology.
THURSDAY.—2 P.M., Dr. Kinnier Wilson: Out-patient Clinic. 3.30 P.M., Dr. Martin: Interstitial Neuritis.
FRIDAY.—2 P.M., Dr. Adie: Out-patient Clinic. 3.30 P.M., Mr. Elmquist: Demonstration of Remedial Exercises (in Exercise Room).

MANCHESTER AND SALFORD HOSPITAL FOR SKIN DISEASES, Quay-street.
THURSDAY, June 17th.—4.30 P.M., Dr. Mumford: Urticaria.

UNIVERSITY OF SHEFFIELD POST-GRADUATE CLINICS.
TUESDAY, June 15th.—3.30 P.M. (at the Jessop Hospital), Mr. Chisholm: Gynæcological Cases.
FRIDAY.—3.30 P.M. (at the Royal Hospital), Dr. Naish: Clinical Cases.

# Appointments.

MASSEY, A., M.D. Leeds, D.P.H., has been appointed Assistant Medical Officer of Health for Plymouth.

RUTHERFORD, E. D., M.B., B.Ch., B.A.O. R.U.I., Capt. R.N. (retd.), a Medical Referee under the Workmen's Compensation Acts (Northern Ireland), 1906 to 1923, for the County of Down.

STEELE, BASIL L., M.R.C.S., L.R.C.P. Lond., L.M.S.S.A., House Physician, Royal Waterloo Hospital for Children and Women.

TATTERSALL, N., M.D., B.S. Lond., M.B., Ch.B. Manch., Tuberculosis Physician to the City of Leeds.

# Vacancies.

*For further information refer to the advertisement columns.*

*Abergavenny, Monmouthshire Mental Hospital.*—Jun. Asst. M.O. £350.
*All Saints' Hospital, Vauxhall Bridge-road, S.W.*—Non.-Res. Jun. H.S. £100.
*Bangor, Carnarvonshire and Anglesey Infirmary.*—H.S. £200.
*Bath, Somerset, and Wilts Central Children's Orthopædic Hospitals, Combe Park.*—Asst. Res. M.O. £120.
*Bethnal Green Metropolitan Borough.*—M.O.H. £1006 10*s.* 6*d.*
*Birmingham, Ministry of Pensions, Highbury Group of Hospitals.* H.P. £350.
*Bristol, Cossham Memorial Hospital, Kingswood.*—Res. M.O. £150.
*Bristol Education Committee.*—Asst. Sch. M.O. £600.
*Bury Infirmary.*—Jun. H.S. £150.
*Buxton, Derbyshire, Devonshire Hospital.*—Asst. H.P. £150.
*Cairo Memorial Ophthalmic Laboratory, Giza.*—Ophth. S. and Director. £E.2000.
*Canterbury, Kent and Canterbury Hospital.*—Res. M.O. £125.
*Chelsea Hospital for Women, Arthur-street, S.W.*—Hon. S. to Ear, Nose, and Throat Dept.
*Chester Royal Infirmary.*—H.P. £150.
*Dreadnought Hospital, Greenwich.*—H.P. and H.S. Each at rate of £110.
*Durham County Mental Hospital, Winterton, Ferryhill.*—Jun. Asst. M.O. £400.
*East London Hospital for Children and Dispensary for Women, Shadwell.*—H.S. At rate of £125.
*Evelina Hospital for Children, Southwark, S.E.*—Hon. Dental S.
*Exminster, Devon Mental Hospital.*—Jun. Asst. M.O. £300.
*Hackney Hospital, 230, High-street, Homerton, E.*—Jun. Asst. M.O. £350.
*Hampshire County Council.*—Asst. M.O.H. £600.
*Hampstead General and North-West London Hospital, Haverstock Hill, N.W.*—Pathologist. £600.

*Hospital for Consumption and Diseases of the Chest, Brompton, S.W.*—Asst. Res. M.O. At rate of £150.
*Hove Hospital, Sackville-road.*—Res. M.O. £150.
*Indian Research Fund Association, Simla.*—Research Workers on Malaria, also Entomologist. Each at rate of Rs.1500 per mensem.
*Italian Hospital, Queen-square, W.C.*—Hon. Asst. P. to Out-patients. Also Radiologist.
*Kenlaw House, Colinsburgh, Fife.*—Asst. Res. P. £500.
*Liverpool Eye and Ear Infirmary, Myrtle-street.*—H.S. £100.
*Manchester, Ancoats Hospital.*—H.S. At rate of £100.
*Manchester, Radium Institute.*—Anæsthetist. £100.
*Manitoba University.*—Asst. Prof. of Anatomy. $3000.
*Miller General Hospital for South-East London, Greenwich-road, S.E.*—Hon. P. to Special Dept. for Children and Hon. Surg. to Genito-Urinary Dept. Also Res. Cas. O., £150; and H.S., £125.
*Norfolk Education Committee.*—Asst. Sch. M.O. £600. Also Locum School Med. Inspector. £11 11*s.* weekly.
*Oldham Royal Infirmary.*—Two H.S.'s. Each at rate of £200.
*Portsmouth, St. Mary's Infirmary, Institution, and Children's Home.*—Third Asst. Res. M.O. £250.
*Queen's Hospital for Children, Hackney-road, E.*—Cas. O. At rate of £100.
*Royal Northern Hospital, Holloway, N.*—Asst. Surg. O. £75.
*Royal Waterloo Hospital for Children and Women, Waterloo-road, S.E.*—Hon. Med. Reg.
*St. Bartholomew's Hospital Medical College.*—Sen. Demonstrator and Demonstrator of Physiology.
*St. John's Hospital for Diseases of the Skin, Leicester-square, W.C.* Hon. Asst. P.
*St. Peter's Hospital for Stone, &c., Henrietta-street, Covent Garden, W.C.*—Clin. Assts.
*Salford Royal Hospital.*—Cas. H.S. At rate of £125.
*Sheffield City.*—Asst. Tuberculosis O. £600.
*Sheffield, Jessop Hospital for Women.*—Sen. Res. O. £250. Also Asst. H.S. At rate of £100.
*Sudan Medical Service.*—Four M.O.'s. £E.720.
*University of London.*—External Examiners.
*Virol Ltd.*—Research Scholarship in Clin. Pathology. £200.
*West-End Hospital for Nervous Diseases, Gloucester Gate, Regent's Park, N.W.*—Asst. P. and Clin. Asst. to the Throat and Ear Department.
*West London Hospital, Hammersmith, W.*—H.P., H.S., Aural H.S. and Res. Cas. O. Each at rate of £100.
*Wimbledon Hospital.*—Res. M.O. 100 guineas.

The Chief Inspector of Factories announces a vacancy for a Certifying Factory Surgeon at Epperstone, Notts.

# Births, Marriages, and Deaths.

## BIRTHS.

MALCOLM.—On June 1st, at Gillingham, Kent, the wife of Surgeon-Commander A. G. Malcolm, of a son.

PARKINSON.—On June 1st, at Banovallum, Horncastle, Lincs., the wife of Dr. William G. Parkinson, of a son.

SHERIDAN.—On June 5th, at Parkfield House, Didsbury, Manchester, the wife of Captain B. C. O. Sheridan, *M.C.*, R.A.M.C., of a daughter.

SMITH.—On May 31st, at Haeremai, Felixstowe-road, Ipswich, the wife of A. Cloudesley Smith, F.R.C.S., of a daughter.

STEPHEN.—At Fort House Nursing Home, Dundee, on 7th inst., to Dr. and Mrs. Stephen, Montrose, a daughter.

TAUNTON.—On June 2nd, at Campbell-road, Hanwell, W., the wife of Richard E. M. Taunton, M.B., Ch.B., of a son.

WRIGHT.—On May 25th, in Dublin, the wife of Surgeon-Commander F. C. Wright, R.N., H.M.S. *Caledon*, of a son.

## MARRIAGES.

DREW—MUIR.—On June 1st, at Holy Trinity Church, Worthing, John Grahame Drew, B.A., M.B., B.Ch. Cantab., M.R.C.S., L.R.C.P. Eng., to Mary Dawson Muir, only daughter of the late Matthew Muir, of Brisbane, Queensland, Australia, and Mrs. Hendry Drew, of London.

GUYER—TAYLOR.—On June 5th, at St. Peter's Church, Lutton-place, Edinburgh, Ronald Brett Guyer, M.B., Ch.B., of Taunton, to Ruth, younger daughter of Mr. and Mrs. J. D. Taylor, Orchardhead-road, Liberton, Edinburgh.

## DEATHS.

ANDERSON-BERRY.—On June 5th, at "Versailles," Stanhope-road, Highgate, David Anderson-Berry, M.D., LL.D., F.R.S. Edin., F.S.A. Scotland, aged 64.

BELL.—On June 4th, at St. Bede's House, Mowbray-road, Sunderland, Alderman Robert Gordon Bell, J.P., M.D., F.R.C.S. Edin., in his 66th year.

COLENSO.—On June 2nd, Robert John Colenso, M.D., of South-well-gardens, S.W., aged 75 years.

HARDWICK.—At Island House, Newquay, Cornwall, June 2nd, Arthur Hardwick, M.D., aged 68 years.

JAMESON.—On June 6th, at Miller's-place, Warwick, George Herbert Jameson, M.D., in his 73rd year.

*N.B.—A fee of 7s. 6d. is charged for the insertion of Notices of Births, Marriages, and Deaths.*

# Notes, Comments, and Abstracts.

## THE COAL CRISIS.

### HEALTH OF THE MINING COMMUNITY.

HEALTH on the coalfields of Great Britain is intimately bound up with the housing conditions of colliery workers, and these, like almost all else connected with the industry, show great diversities. They are often, as the Royal Commission on the Coal Industry found, very bad—many of the old villages consist of poorly constructed cottages, small and frequently overcrowded, with sanitary arrangements primitive and inadequate, the aspect of the villages being drab and dreary to the last degree. At the other extreme there have been built, by some of the large new colliery companies, garden villages, which are well planned, well constructed, and well equipped, equal to any in Great Britain. Between the two there is every gradation. In some of the districts, where the housing is usually poor, there may be found groups of excellent new cottages, built by enterprising colliery proprietors or local authorities. In some of the districts, where the housing in general is fairly good, there may be found groups of old houses surviving from the days when the standard of construction was low.

The Commission was unable to find any general statistics relating to miners' housing as such.[1] The material that is available relates to districts in which over 20 per cent. of the population are employed in mines. Some qualification also has to be made in respect of the standard of "overcrowding" that has long been adopted in the official statistics on this subject. Under that standard, wherever a family are living more than two persons to a room, they are regarded as being under conditions of overcrowding. In Scotland, however, in the mining villages, as in the agricultural villages, the houses often consist of one storey, usually divided into two rooms, which are very large in comparison with the rooms in the ordinary English or Welsh working-class house; sometimes there is a third smaller room; occasionally, on the other hand, the house consists of only one large room. If, in a cottage of two large rooms and one smaller one, there were living, for example, a family of seven persons—the parents and an infant sleeping in one room, two girls in the second, and two boys in the third—this, according to the English standard, would be regarded statistically as a case of overcrowding. But it is certain that the family would not so regard it themselves, nor would the general opinion of the locality. Similar considerations arise in the older villages in Northumberland and Durham, where the customs as to housing are much the same.

#### ON TYNESIDE.

The Prime Minister, in his statement to the House of Commons at the beginning of the general strike, referred feelingly to the complicated methods of remuneration in the coal industry. There are certainly a surprising number of deductions, offset by privileges which are difficult to value accurately in cash. In Northumberland and Durham, and in parts of Scotland, the confusion is rendered worse by the fact that some miners are entitled to a free colliery house, which may be anything from a decent little house (much like those which are springing up on council estates all over the country) to a two-roomed dwelling with disgraceful sanitary arrangements. It is more likely to approximate to the latter than to the former. Not all miners are entitled to a free house, but only the higher grades; and even in these grades many men do not get a house, but only an allowance (usually 10*d.* a day) towards rent. The allocation of free colliery houses gives rise to a good deal of friction, besides adding to the difficulty of assessing the actual cash value of a man's job.

Furthermore, the free colliery house has had a most deplorable effect upon the housing of those counties in which it obtains. It is significant that Northumberland and Durham, the only counties in England and Wales in which they are found, stand quite apart from the rest of the country in respect of overcrowding. The figures are startling; whilst in England and Wales as a whole the percentage of overcrowded persons was in 1921 less than 10, in Northumberland and Durham it was approximately 30. Outside of these two counties a figure of 30 per cent. of overcrowding is only found in the worst boroughs of the

[1] The Bureau of Social Research for Tyneside is collecting information about social and industrial conditions on Tyneside. Two papers have already been issued: No. 1 on Population, No. 2 on House-room on Tyneside. Copies of these papers can be obtained for 2*d.* (post free, 2½*d.*), from Mr. J. J. Pembrey, 14, Cloth Market, Newcastle; and further information from the Director of the Bureau, Mr. Henry A. Mess, B.A., 18, Ellison-place, Newcastle-upon-Tyne.

East End of London. In Northumberland and Durham the bulk of the working classes live in homes of two or three rooms, whereas in the rest of England and Wales a similar population lives in homes of three or four rooms.

Of course, the free colliery house, or indeed any kind of colliery house, is not the only factor in the causation of this exceptional and deplorable state of affairs. A shipbuilding town like Jarrow shows an even higher percentage of overcrowded persons. But it is the opinion of many who know the two counties well that the free colliery house did much in the past to set the standard of housing; and when the shipbuilding towns grew up, they grew up in areas where one or two rooms were considered good enough for a working-class family. If the set purpose had been to check ambition for better homes, no better way could have been devised to achieve that end than the free colliery house system. A family, which might have struggled and sacrificed in other circumstances to obtain something better, would obviously not do so whilst a home of a kind could be had for nothing, and was indeed part of the wage. The colliery owners on their side had little incentive to build well, and some real difficulties; much coal-mining has been of a speculative nature and leases were often for 21 years only, so that there was a considerable risk of losing capital sunk in building schemes. The more credit is due to those exceptional colliery companies which have built model villages against which no serious criticism can be levelled.

Whilst the homes of Northumberland and Durham are exceptionally small the families are exceptionally large. The birth-rate in Durham, whilst falling as elsewhere, is roughly 50 per cent. above the birth-rate for England and Wales as a whole. On the north side of the Tyne the birth-rate is not quite so high, but it is well above the average for the country. Marriages are early; in Durham, a few years ago, one bride in four was under age. With regard to overcrowding and a high birth-rate, there is almost certainly a circle of cause and effect; young men and young women are glad to escape as soon as possible to make a fresh home, and there are other obvious ways in which overcrowding operates. In Northumberland and Durham there is the further unfortunate feature that over most of the area the sanitary arrangements are bad. Even Gateshead, with its 130,000 inhabitants, is only now converting to water-carriage, and in most of the Tyneside towns, as well as in the Hinterland, a considerable number of ash privies or of pails will be found. Naturally there is a high infantile mortality. The actual figures are rather better than might have been supposed, perhaps because of the energy of the public health officials, but the infantile mortality rate for the county of Durham has been for the last 20 years between 12 and 20 per 1000 above that of the country as a whole.

If it should happen, as seems very likely for economic reasons, that there should take place a closing of pits on a large scale and a migration of miners to other areas, there will be a great deal of suffering in the process and anything possible should be done to mitigate it. But it would not be without compensation. It would mean the thinning out of the most overcrowded homes in England and Wales, and there would be for thousands of families a compulsory break with a bad tradition. The newer coalfields are not cursed with the free colliery house and with the deplorably low standards with which the north-east corner of England is infected.

### THE SOUTH WALES COALFIELD.

The South Wales coalfield is not so old as some of the others (e.g., South Staffordshire and Northumberland), and the housing conditions are proportionately more modern. The coalfield is broken up into a series of narrow valleys, on the sides of which the miners' dwellings are built in ascending rows. During the winter months the hills keep any sun there is from gaining access to the valleys, while the steepness of the banks upon which the houses are built militates against the provision of recreation facilities. Nevertheless, in recent years much is being done through the grants provided by the Miners' Welfare Fund to improve this latter position.

When the health of this community is examined, it is found to have been in recent years more favourable than might have been anticipated. The mining community form with their dependents at least three-quarters of the total population of the county of Glamorgan. The birth-rate of the county, which was 31·0 in 1914, declined to 23·1 in 1919, and after a rise in the post-war years fell again to 21·8 in 1925; these rates have been throughout higher than those for England and Wales, for which the birth-rate was 23·8 in 1914 and 18·3 in 1925. The general death-rate has consistently, since 1912, been lower than that for England and Wales; it was 13·5 in 1914, 11·7 in 1919, and 11·2 in 1925; the corresponding rates for England and Wales were 14·0, 13·8, and 12·2. Infant mortality is usually considered a delicate index to the health of a community, and is of particular interest for a community like the coal-miners, who have always exhibited a high birth-rate. In 1904 the mortality for the county was 176 as compared with 146 for the Kingdom. In 1918 it had fallen to 95, when it was actually below that, 97, for the Kingdom; in 1925 it was 83 as compared with 75. Taken as a whole these mortality records must be considered as favourable for a coal-mining population. A further point throws some light upon the sanitary state of the buildings, of which the prevalence of enteric fever is held to be some indication; in 1904 the death-rate from this disease was 0·39 for Glamorgan as compared with 0·23 for the Kingdom—it had fallen by 1925 to 0·01 as compared with 0·006.

At the present moment relief coming from either public resources, such as the feeding of school-children, unemployment benefit, or from such sources as strike pay and private contributions, place any industrial community, temporarily thrown upon its own resources owing to cessation of work, in a better position than it would have been 20 years ago. The systematic feeding of school-children was instituted in the county, the Whitsuntide holiday being suspended so as to permit provision of meals to continue without a break. The mining community is suffering undoubted privations, a position which reacts promptly on the small purveyors.

## LEBANON HOSPITAL FOR MENTAL DISEASES.

THIS hospital is the only one of its kind in the Near East. For the last 17 years Dr. H. Watson-Smith has been director and throughout the war he was able to carry on the work steadily, though virtually a prisoner in the hands of the Turks. Since then the buildings have been repaired and the work developed. During the past year 135 patients (83 men and 52 women) were admitted. From the previous year there remained 95 patients (48 men and 47 women), making a total of 230 patients (131 men and 99 women) under care and treatment throughout the year. Of this number 33 (16 men and 17 women) were discharged completely recovered and enjoying full mental health. Thirty-seven patients (25 men and 12 women) were discharged improved, although the nature of their malady renders it possible that they may relapse in the future. Fifteen men and 3 women were discharged as not improved, several of these being removed by impatient relatives against medical advice Primitive methods of treatment in the form of exorcism are still much in use.

At the twenty-seventh annual meeting of the hospital held at the rooms of the Medical Society of London on June 1st, the chairman of the General Committee, Dr. E. W. G. Masterman, presided. He had recently visited the hospital, and he said that boring to a depth of another 300 feet, where an ample constant supply of water would be available, was vital to the well-being of the community. The number of acute women patients was increasing, and single room accommodation for these was becoming pressing. Such cases were unlikely to decrease during the present troublous times in Syria. The payments of the French Government for necessitous cases had fallen in value with the fall of the franc. Dr. Masterman paid a tribute to the valuable work of the executive committee in Beyrout.

Mr. W. A. Albright, J.P., one of the trustees, who had also lately visited the hospital, said that far more facilities for curative open-air occupation would be opened out when the land could be irrigated and brought under cultivation. Mr. F. Hourani spoke of the great service of the hospital to the Syrian nation and hoped that in course of time Syrians would take the burden of the work upon their own shoulders. Dr. J. F. Whitwell presented the report of the medical director, which includes statistical tables showing the prevalent forms of mental disorder in the East. Dr. Fortescue Fox referred to Asfuriyeh as a centre of treatment, of teaching, and of research. The resident fifth-year students to be supported by the Rockefeller Foundation would be of assistance to the Director in his work as clinical professor of psychiatry in the American University of Beyrout. Dr. Fox looked forward with confidence to further light being shed from this centre upon the difficult problems associated with mental disease. Mr. Joseph Butler, senior honorary treasurer, stated that over £1000 a year was contributed in Syria itself on behalf of patients. Dr. Percy Smith mentioned that it was at Bethlem Hospital that the general committee first met. Dr. Bedford Pierce moved a vote of thanks to auxiliary committees in America, Switzerland, and Holland.

Copies of the report can be obtained from the general secretary, Miss Hilda Fox, 67, High-street, Marylebone, W.1.

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**DONATIONS AND BEQUESTS.**—Under the will of the late Mr. Milton Haydock, of Churchfield House, Great Harwood, Lancs, the testator left £2000 to the Blackburn and East Lancs Royal Infirmary.